Chemical Week

August 18, 1951 Price 35 cents

It's where the dollars are; that's why so many chlorine makers are elbowing into organics ..... p. 13

Dig in or disperse, bomb-conscious defense officials warn industry ..... p. 15

Lignite tapped as cheap power fuel in gas-rich Texas; key: chemical bonus ..... p. 25

Cortisone scramble: many firms, processes, raw materials vie for top spot ..... p. 29

CW Camera: Hoe hangs in toolshed as chemicals "weed" cotton ... p. 37

A McGRAW-HILL PUBLICATION

for DETERGENCY

It is effective on an unusually wide variety of soils. NYTRON has excellent power to remove oil and grease from fabrics, surfaces, metal parts. It cleans efficiently in cold, as well as warm or hot water and retains its detergent action when used in either acid or alkaline mediums.

for HARD WATER ACTION

NYTRON is more economical because increased quantities do not have to be added to compensate for water hardness; completely prevents the formation of scum, grease rings, streaks, spots.

for CHEMICAL STABILITY

Remains chemically stable over a wide range of temperatures, acidity or alkalinity.

for RAPID SOLUBILITY

NYTRON goes into solution almost instantly in hot or cold water and will not "salt out" in concentrated solutions of many acids, alkalies or metallic salts.

NYTRON

TRADE-MARK REG. U. S. PAT. OFF.

FOR PERFORMANCE

because...

NO OTHER WETTING AGENT-DETERGENT MATCHES NYTRON'S COMBINATION OF PROPERTIES

for QUICK, THOROUGH RINSING

NYTRON rinses promptly and completely in cool or even cold water, does not leave an insoluble deposit.

for REDUCED WETTING TIME

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for FOAMING

NYTRON will foam in any normal concentration of acid or alkali, in distilled water or sea water, in ice cold or boiling water.

for IMPROVING PERFORMANCE OF SOAP

Improves quality and lowers cost when used to partially or completely replace high-priced soap.

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I want to know more about NYTRON, the Synthetic Organic Detergent with the exclusive combination of properties. Send me a free sample plus non-technical information and specific technical data.

Name_____ Title_____ Company_____ Address_____ City_____ Zone_____ State_____ CI-8

Chemical Week

Volume 69 Number 7

August 18, 1951

OPINION	2
NEWSLETTER	7
BUSINESS & INDUSTRY	13
PRODUCTION	25
RESEARCH	29
SPECIALTIES	32
BOOKS	38
MEETINGS	38
MARKETS	41
BOOKLETS	48

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LOW COST

RESINOUS PLASTICIZER-EXTENDER FOR POLYVINYL ACETATES

POLYCO 438 is a low cost new resinous plasticizer-extender for polyvinyl acetate. It is completely compatible with all grades of polyvinyl acetate and adhesive compounders can extend their supply by its usage.

This new resin is being used for compounding padding adhesives, cellophane adhesives, case sealing compounds, folding box adhesives and low cost general adhesives.

For complete information and formulas for compounding, write for data sheet P-30.

POLYCO

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Fatty Acid Esters

MADE TO MEET YOUR SPECIFICATIONS

- STEARATES
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THE FLAME AND THE FLASK—SYMBOL OF QUALITY

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OPINION . . . . .

Log Dangers

To THE EDITOR: Re the article entitled "Alkali Price Change Ahead" (June 30) . . . it is very well written . . . we agree that a price change in alkalies is necessary.

However, the writer questions the use of logarithmic co-ordinates on the curves shown . . . as the use of logarithmic co-ordinates can cause misleading conclusions. For example, if one were to plot two variables with a constant difference on logarithmic paper, and then project these lines into the future, the lines would cross even though the difference is constant. Taking an example from your curve, "U. S. Caustic Soda Production," the following results can be read:

	1930	1946
Total Caustic	6.8	19
Electrolytic Caustic	2.1	12
Difference	4.7	7
% Electrolytic Caustic	31%	63%

From the curve using logarithmic co-ordinates one can get the impression that electrolytic caustic soda production has approached the total caustic soda production at a much faster rate than has actually occurred—as evidenced by the above table. True, there is no question but what electrolytic caustic is going to shove chemical caustic out of the market, and the trend is being accelerated by the present expansion of chlorine capacity.

Possibly my greatest objection to the use of logarithmic co-ordinates is the practice of extending the lines into future years and the incorrect conclusions that can be drawn from this practice.

C. C. BRUMBAUGH
Director, Research & Development
Diamond Alkali Co.
Cleveland, Ohio

A sound point, Reader Brumbaugh. There are dangers inherent in the use of log co-ordinates; but they're graphic, highlight (and admittedly visually over-emphasize) a trend.—ED.

Only the Small?

To THE EDITOR: I have read with great interest your article "More Tonnage for Titanium" (June 16), and also the letters on the subject you have printed subsequently . . .

I have for the past two years been doing research work for this company on titanifierous ores chemical and metallurgical development in extraction . . . separation of titanium oxides from the ore, reduction of the oxides . . . ferro-titanium alloy and iron powder . . . also suitable for $TiCl_4$.

We have contacted numerous firms who may have uses for this ore but we have been turned down so many times . . . we are beginning to wonder if anybody is interested in titanium.

We even tried to obtain government help to no avail. I say the only way to help the war effort and increase the production of titanium and its compounds is to help small firms to produce it, especially firms with the know how.

Then and only then can the U.S.A. get the required production of this important element.

R. C. MIGLIORINO
The Choteau Mining & Development Co., Inc.
Choteau, Montana

Hormone Debate

To THE EDITOR: In your article entitled Hormone Debate (July 28), you state that last year's total market (of diethylstilbestrol) for poultry purposes only amounted to 450 kilos.

Judging by our own production and sales which are a sizeable part of the 2700 pounds reported manufactured in this country by the U. S. Tariff Commission, the poultry market almost certainly accounts for more than one-third of production.

Our estimate is that manufacturers and distributors of stilbestrol pellets use over two-thirds of the reported production, whereas the use in human therapy accounts for less than 700 pounds yearly.

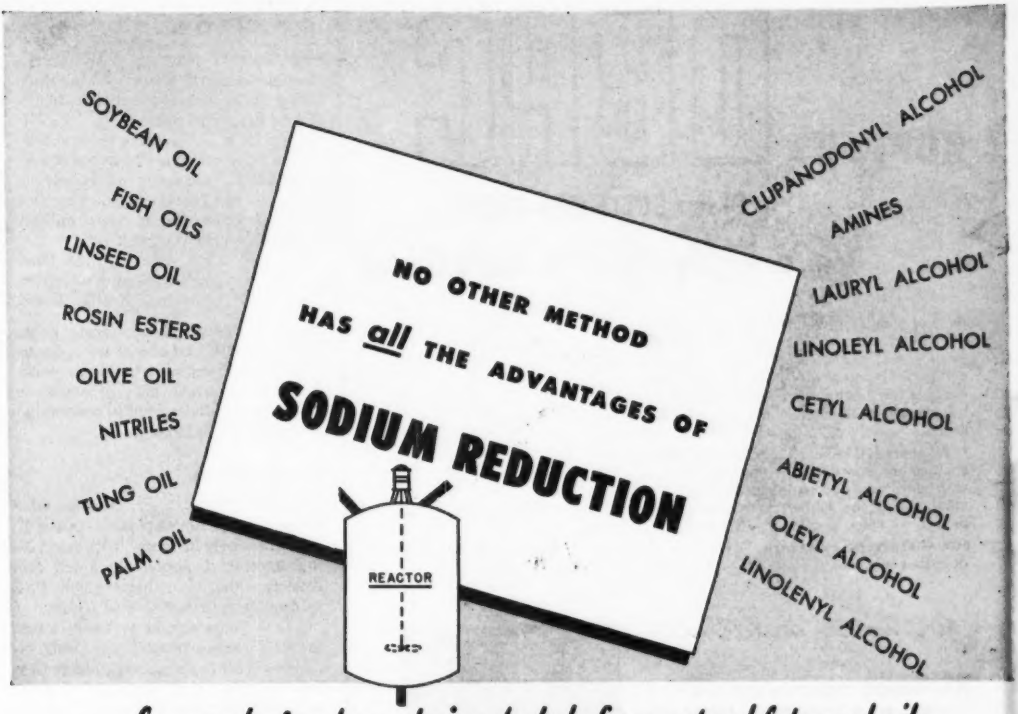
P. C. HERELD
Executive Vice-President
Chemo Puro Manufacturing Corp.
Long Island City, N. Y.

CW's estimate was derived thus: The USDA said that 30 million chickens were hormonized in 1950. On the basis of 15 mg. per chicken total stilbestrol would approximate 450 kilos. Not included: turkeys, because an unknown number—but less than 5%—were so caponized.—ED.

Eternally Wrong

To THE EDITOR: In your article, "Army Package Probe" (July 29), you say, "during the early years of the war, only 45% of all the material shipped overseas arrived in a usable condition. By 1945, the figure was reduced to 25%."

This fully confirms the suspicions of every soldier and sailor in the last



for producing long-chain alcohols from natural fats and oils

Check these Advantages

- unsaturation can be retained
- applicable to wide range of raw materials
- no high pressure required — uses standard equipment
- no catalyst required
- low maintenance cost
- gives high quality products without undesirable by-products.

NATIONAL DISTILLERS CHEMICAL CORPORATION

The Sodium Reduction method is an established commercial process for producing long-chain alcohols from natural fats and oils. It is not limited to any particular natural product.

Sodium Reduction offers a distinct advantage in the manufacture of unsaturated alcohols such as those derived from fish, soya, linseed and other natural fats and oils. Alcohols having a degree of unsaturation equivalent to the starting materials have been produced by this method.

Among the suggested uses for these unsaturated alcohols are the preparation of vinyl and allyl ethers, methacrylate esters and phosphate esters. These derivatives have properties which indicate possible application in the field of drying oils, plasticizers, paint resins, synthetic waxes, elastomers, polymers and emulsifying agents.

Metallic Sodium may be used to advantage in the reduction of nitriles, esters and ketones.

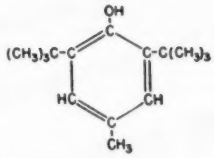
Perhaps your process or product can benefit from this method of reduction. National Distillers Chemical Corporation will welcome your inquiry.

National Distillers
CHEMICAL CORPORATION
Plant and Sales Offices: Ashtabula, Ohio

KOPPERS DBPC

Di-tert-BUTYL-para-CRESOL

is a highly-effective antioxidant

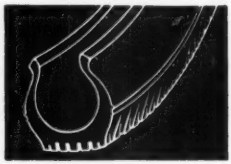


● Koppers 2,6 Di-tert-butyl-para-cresol (DBPC) is a crystalline, tri-alkylated phenol, easily soluble in common organic solvents. Being a hindered phenol, it undergoes few of the reactions typical of unhindered phenols, such as phenol and meta-cresol.

Koppers DBPC is an oxidation inhibitor that is non-staining and non-corrosive; it is insoluble in aqueous solutions of acids or alkalis. For the rubber, petroleum and insecticide industries, DBPC has proved its value as a highly-effective antioxidant.

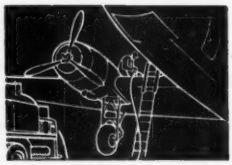
FOR FURTHER INFORMATION, write for your copy of Bulletin C-9-115. It describes in detail the properties, reactions and uses of DBPC.

for these industries



RUBBER DBPC is useful as a "non-coloring" and a "non-staining" rubber anti-oxidant, because it causes little or no discoloration of white or light-colored rubber products, even after prolonged exposure to light, heat and air.

INSECTICIDE DBPC is especially effective in the prevention of oxidation and deterioration of insecticide compositions containing pyrethrin. Pyrethrin has a marked tendency to decompose on exposure to light or air; such decomposition results in a marked decrease in the insecticidal value of the product. DBPC inhibits these oxidation processes, thus prolonging potency of the insecticide.



PETROLEUM DBPC is an excellent antioxidant for high-grade lubricating oils for low-temperature service such as spindle oils, gun greases, waxes, etc., and for such oils as turbine oils and transformer oils. In these oils, it inhibits the formation of gums and acidic products which are formed due to oxidation.

It is also one of the most effective inhibitors for the reduction of gum formation in aviation gasolines, where it is important to effect the inhibition without the production of undesirable deposits of residues in carburetors.

Though supplies are at present limited by the emergency demand, many known possibilities of DBPC make it a most interesting chemical for further study in your laboratories.

KOPPERS

KOPPERS COMPANY, INC.

Chemical Division

Dept. CEN-8-18, Koppers Building, Pittsburgh 19, Pa.

OPINION . . . . . .

war, each of whom was sure in his own mind that the services were operating in this manner, but lacked published figures to prove it.

You have performed a great service to millions of eternally-wrong G. I.'s who can . . . see the actual figures . . . have the satisfaction of knowing that at least once during their military careers they were right.

J. M. HINE
The Borden Company
Seattle, Wash.

Tongue-in-cheek Reader Hine pokes sly fun at CW and also at the military. The "figure" referred to in our packaging news article was, of course, a reduction in loss and not in percentage of usable goods landed.—ED.

Food Chem.

TO THE EDITOR: . . . As one who followed the developments concerning "chemicals in foods" with increasing interest, I appreciate much the coverage that you have given this subject in your last several issues.

These items should certainly serve to interest more people in the subject . . . this is all to the good . . . increases the chances that eventually with enough people thinking about the subject, better answers than are presently apparent may be obtained to some of the questions which have been raised by various individuals . . .

WILBUR H. MILLER
American Cyanamid Co.
Washington, D. C.

Industry's Position

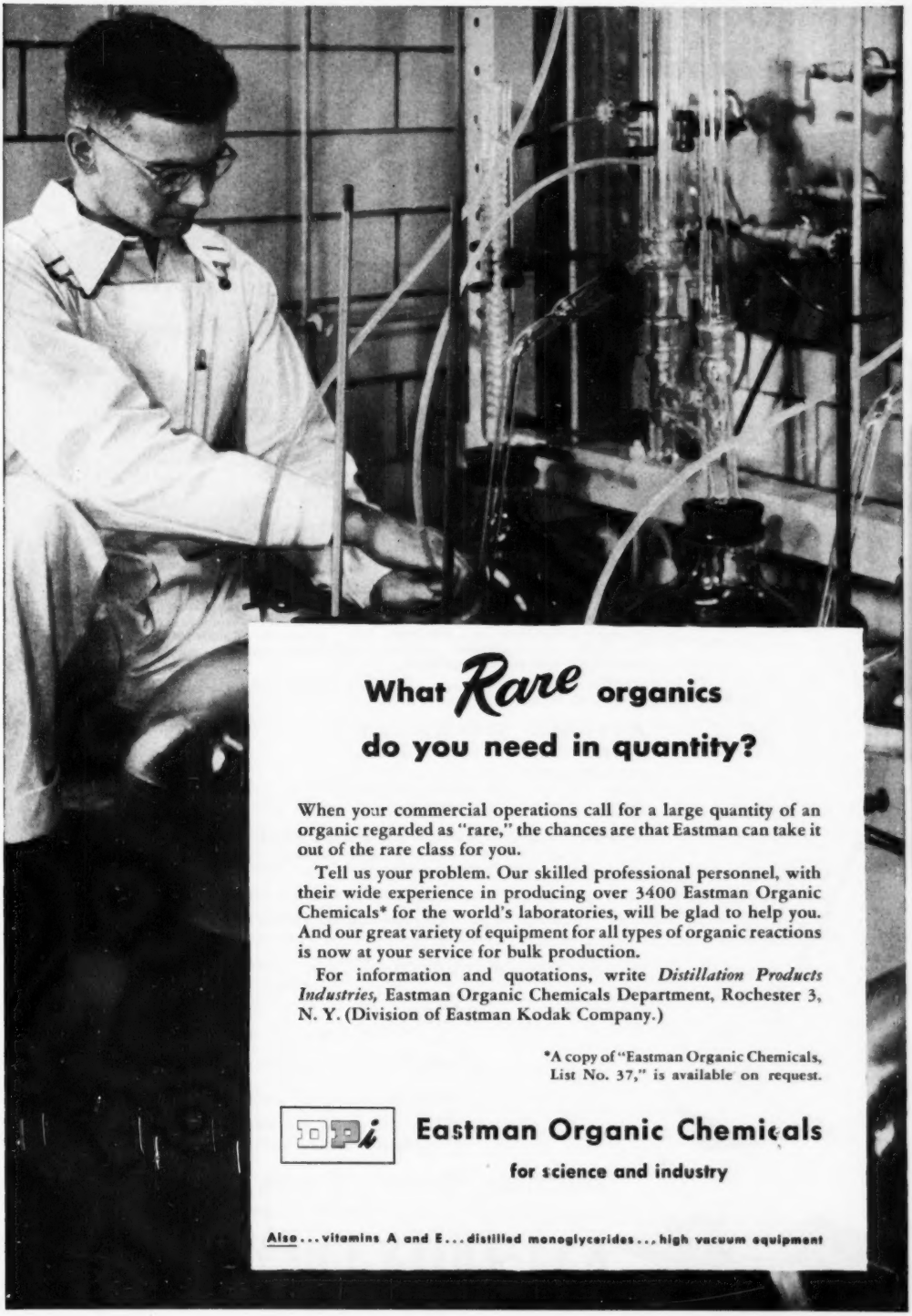
TO THE EDITOR: I have just read your recent article on the subject of chemicals in foods, (Coming: Tougher Food Law, July 14) . . . It is most refreshing to see a straightforward presentation of the issues involved and such a clear statement of the industry's position in this matter. All too often industry is accused of resisting all change for purely selfish monetary reasons.

I would like to compliment and congratulate you on a very fine article. . . .

G. J. WILLIAMS
Legal Department
The Dow Chemical Company
Midland, Mich.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: The Editor, Chemical Week, 330 W. 42nd St., New York 18, N. Y.



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When your commercial operations call for a large quantity of an organic regarded as "rare," the chances are that Eastman can take it out of the rare class for you.

Tell us your problem. Our skilled professional personnel, with their wide experience in producing over 3400 Eastman Organic Chemicals* for the world's laboratories, will be glad to help you. And our great variety of equipment for all types of organic reactions is now at your service for bulk production.

For information and quotations, write *Distillation Products Industries,* Eastman Organic Chemicals Department, Rochester 3, N. Y. (Division of Eastman Kodak Company.)

*A copy of "Eastman Organic Chemicals, List No. 37," is available on request.

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for science and industry

Also... vitamins A and E... distilled monoglycerides... high vacuum equipment

Phenylacetic Acid

While the full potential of PHENYLACETIC ACID in synthesis has not been explored, a reactive methylene group has made it a valuable general organic intermediate. It is well-known as a penicillin precursor and has been mentioned as a plant fungicide and hormone. Other suggested uses are as an intermediate for drugs (antispasmodics, sedatives, antiseptics, and anticoagulants); perfume aromatics; and insect repellents.

Kay-Fries also manufactures alkali metal salts of phenylacetic acid, both anhydrous and in solution.

KAY-FRIES SPECIFICATIONS . . .

purity	• 99.0% minimum
melting point	• 74.5°C. minimum
ash	• .05% maximum
form	• White flakes

TYPICAL REACTIONS of PHENYLACETIC ACID

Phenylacetic acid undergoes anhydride formation, chlorination to the acid chloride, esterification, amidation, in the normal manner of an organic acid.

condensation

$$C_6H_5CH_2COOH + C_6H_5CHO \xrightarrow{\text{catalyst}} C_6H_5CH{=}C(C_6H_5)COOH + H_2O$$

benzaldehyde — α-phenylcinnamic acid

$$C_6H_5CH_2COONa + C_6H_5(OH)COCH_3 \xrightarrow{\text{catalyst}} C_6H_4OCOC(C_6H_5){=}C(CH_3) + NaOH + H_2O$$

sodium phenyl acetate — o-hydroxy-acetophenone — 3-phenyl-4-methyl coumarin

reduction

$$C_6H_5CH_2COOH + 3H_2 \xrightarrow{\text{catalyst}} C_6H_{11}CH_2COOH$$

cyclohexylacetic acid

Varied conditions will give phenylacetaldehyde

For availability and technical information please write or phone.

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NEWSLETTER

You can expect National Production Authority to extend the scope of its M-32 and M-45 orders.

Now in preparation are provisos adding five or six chemicals to the list covered by M-32. This order allows manufacturers to refuse defense orders requiring more than a specified proportion of their output.

Two or three commodities will be added to the M-45 list of chemicals under allocation.

Sulfur is still the knottiest problem facing Government planners, but Manly Fleischmann's top spot in both NPA and DPA is bringing about better liaison between the two.

It's pretty sure that M-69, NPA's sulfur order, will be revised. The way it looks now DPA will fix over-all industry quotas—rubber, petroleum, agriculture, etc.—and NPA's Chemical Division will take it from there, probably as it's done now by informal allocation to consumers on the basis of past use. A more formal CMP-type allocation is still a possibility, however, that shouldn't be dismissed.

Encouragement of sulfur recovery (CW Newsletter, Aug. 11) is also in the cards. Firms which install recovery units will probably be allowed to keep all or at least most of their production in addition to their normal quotas. Many firms have gone ahead without black-and-white assurance of such a bonus.

The petroleum industry is an example. By the end of '52 refiners will recover 196,000 tons a year more than they use, estimates Petroleum Administration for Defense. Right now the industry is about breaking even. But even with the foreseeable surplus, PAD is urging NPA not to reduce sulfur allotments to oil producers.

Texas is taking its bite out of sulfur recoverers. The state just collected its first production tax on sulfur made from sour gas—1,108 long tons recovered by Shamrock Oil & Gas Co. On September 1 the severance tax will be "rounded off" from $1.3992 to $1.40 a ton.

Synthetic detergent makers see sulfur supply as a ceiling on production. They've got hold of enough sulfur this year to boost output 18% above last year, but they look for trouble in upping the output rate another 15% next year—which higher needs, they estimate, will call for.

Nor does it look as if U. S. consumers will gain much by reduced exports to Britain. The current take is 408,000 tons a year—and even by 1954 it looks as if the Britishers will require at least 300,000 tons.

Gasoline from coal is still a long way off, but conversations now in progress between the U. S. Department of the Interior and the investment banking firm, F. Eberstadt & Co., may shorten the wait.

Eberstadt wants to put up a plant—estimated cost: up to $300 million—to produce 15,000-30,000 barrels a day. The product would be about half gasoline, the rest aromatic hydrocarbons and phenols.

Hitch is that Eberstadt would probably need Government assurance of markets and/or price support to justify the investment. Even if terms can be agreed upon, construction may take three years.

NEWSLETTER

If you haven't filed under CPR-22 yet, don't worry about the deadline: OPS has revoked it "until the dust settles." If you're operating under the General Ceiling Price Regulation, you can either continue to do so or else go through the paper work necessary to get under CPR-22.

Reason for the snarl is OPS's indecision about administering the Capehart amendment. It talks of handling each application individually, but by all odds it will be forced to issue a blanket procedure—either as an overriding order or as a complete replacement for CPR-22—which will trim OPS's paper work to fit its staff.

OPS doesn't want to let industry allocate overhead costs as it wishes among different products and different lines—assigning a disproportionate amount, perhaps, to a best-seller.

Since auditing individual claims would be a colossal task, best bet is some "simple" formula for overhead allocations, based on a product's percentage of sales, floor space used in production, value of production equipment, man-hours spent in manufacture, or some such ratio.

Whatever basis is used, more paper work seems inevitable.

Look for a shake-up soon among the Government agencies handling minerals. Accusing the Defense Minerals Administration of stalling on the minerals expansion program, General Services Administrator Jess Larson has set up a Defense Materials Procurement Agency, which will take over many of the executive functions now handled by DMA.

But DMA had a lot of responsibility, inadequate authority. There's no telling yet whether DMPA will throw more weight around.

Manufacturers of cellulose products from Northern European chemical pulp have been granted an inventory reprieve by NPA. Until now they've been limited to a 45 days' supply; but since many Northern European ports are icebound in the winter, NPA is allowing up to 120 days' inventory—depending on how dependent a user is on foreign pulp.

The U. S. Department of Commerce describes the customs simplification bill now before Congress as an innocent easing of procedure.

But the Synthetic Organic Chemicals Manufacturers Association thinks otherwise, sees a threat to the U. S. chemical industry, particularly in the provision that bases duties on the export value rather than the U. S. selling price. This, claims SOCMA, would allow foreign producers and cartels to manipulate prices to their own advantage.

SOCMA appeared against the bill this week, pressed for its defeat. But supporting it are the Commerce and Treasury Departments, the U. S. Chamber of Commerce, and importers' groups.

News will soon pop in Cleveland on a couple of developments:

Glidden & Co. will bring out a new, top-secret product any day now. Company officials say it will be as revolutionary as latex-based paints were when they hit the market three years ago.

International Salt Co. officials appeared before the Avon Lake (Cleveland suburb) Council this week, asked a zoning change to permit them to spend $5 million on facilities to mine and rough-process salt.

Nature didn't provide peaches with a wax coating, but Food Machinery & Chemical Corp. is now demonstrating a machine that remedies that oversight. Rows of brushes push peaches along while a mist of melted wax is sprayed on the fruit. Process is fast and drying is rapid. Advantages: cuts fuzziness, seals flavor, prevents evaporation weight loss.

. . . The Editors

HIGH- WHITE *and handsome!*

because of

Antara® Brightener A

Yes, white fabrics can be washed "whiter than white" because of Antara Brightener A. This cotton substantive, optical whitening agent of high activity is added to soaps or detergents. In washing textile fabrics, for which it has high affinity, it makes normally-invisible ultra-violet light visible. Fabrics so treated show increased surface reflectance because of millions of tiny fluorescent "light bulbs" interspersed throughout the material. Even colored fabrics show up brighter because of Antara Brightener A. Antara Brightener A is easily incorporated into soaps and detergents in standard equipment. Laundries employ it in the standard wash cycle.

Other Brightener Products *of GDC will brighten wool, nylon, starches, high quality paper and other cellulosic materials*

WRITE DEPT. CW8 FOR YOUR COPY OF OUR ANTARA BRIGHTENER BULLETIN

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MONSANTO
CHEMICALS for PLASTICS

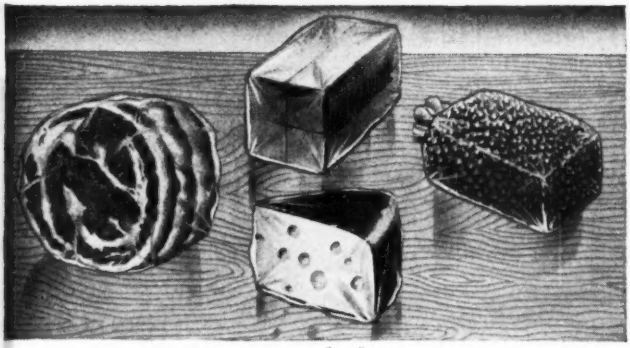
FOR YOUR INFORMATION

Every month Monsanto publishes these pages of pertinent information which may be useful to you. This issue discusses:

Plasticizers **Detergents**
Catalysts **Wetting Agents**

Further information will be furnished upon request.

Nontoxic plasticizers available to food packaging manufacturers



If you are manufacturing packages for foods, or if you have such products in the development stage, we suggest you investigate three Monsanto nontoxic plastizers.

Santicizer* 141 (alkyl aryl phosphate), Santicizer B-16 (butyl phthalyl butyl glycolate) and Santicizer E-15 (ethyl phthalyl ethyl glycolate) all have been accepted as nontoxic plasticizers by the Bureau of Animal Industry of the United States Department of Agriculture.

While it will be necessary for you to get the bureau's approval on your nontoxic packaging materials, you can be sure that the plasticizer in your formula will pass muster if you choose one of these Santicizers.

Many makers of packaging materials already are using Santicizers 141, B-16 and E-15. They are employed in coatings for milk cartons, in wrappings for margarine and containers for other foods. Employed in film for wrapping fresh meats, Santicizer 141 helps to prevent discoloration of the food.

For technical information and for assistance in perfecting your formulations, contact the nearest Monsanto Sales Office or mail the coupon.

Ortho-Nitrobiphenyl . . .

low-priced plasticizer that's efficient . . . and *available*

If costs and availability of plasticizers are headaches in your business, we suggest you investigate Monsanto's ortho-nitrobiphenyl today. ONB is efficient as a primary plasticizer or as an extender, and it is immediately available in any quantities you need. It sells for only 14½ cents a pound in truckloads or carlots.

Ortho-nitrobiphenyl (also known as ortho-nitrodiphenyl) is compatible with cellulose esters and ethers, polyvinyl chloride, polyvinyl butyral, polyvinyl acetate, styrene, rosin and rosin esters, modified phenolic resins, oil-soluble alkyd resins and vegetable oils. This wide compatibility, plus its low hydrolysis rate and low price, makes ONB an unusually attractive plasticizer.

Most resins, both natural and synthetic, can be plasticized with ONB. The amount of required plasticizer varies with the resins and the use of the finished product. The volatility of ortho-nitrobiphenyl is less than diethyl phthalate and greater than dibutyl phthalate.

Ortho-nitrobiphenyl is readily soluble in carbon tetrachloride, mineral spirits, pine oil, turpentine, benzene, acetone, glacial acetic acid and perchlorethylene. It is a good solvent.

For technical information on ortho-nitrobiphenyl, contact the nearest Monsanto Sales Office or mail the coupon for a copy of Monsanto Technical Bulletin No. OD-102.

Santicizer 8 eases shortage of plasticizers

Available in a day of shortages, Monsanto Santicizer 8 offers a solution to many a plastic manufacturer's problem. It imparts desirable characteristics to both plastics and coatings.

Santicizer 8, a light-yellow, viscous liquid, is readily soluble in all common organic solvents except petroleum hydrocarbons. It is only *very slightly* soluble in petroleum hydrocarbons. It is a valuable plasticizer for products required to withstand gasoline, greases and related products.

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Stable adhesives with good adhesion and flexibility are produced by Santicizer 8 in polyvinyl acetate.

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For data and information on assistance in formulating, contact the nearest Monsanto Sales Office or mail the coupon.

* * * * * * *

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Formula:

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General Information — Properties: A mixture of approx. 80% para isomer and 20% ortho isomer.

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BUSINESS & INDUSTRY . . . . .

Enhanced Alkali-Chlorine

A major alkali-chlorine maker, Diamond Alkali Corp., is now expanding its output of synthetic organic chemicals.

It's a trend—and behind it is low profit on alkali and chlorine sold as such.

Purchase last week by Diamond Alkali Co. of the prominent insecticide and herbicide manufacturer, Kolker Chemical Works, Inc., highlights the near completion of another expansion cycle by the dozen companies whose major business is the manufacture of alkalies (soda ash and caustic soda) and chlorine.

Not content with this purchase, Diamond is expanding its production of chlorinated paraffin and carbon tetrachloride and will move its manufacture of perchlorethylene and vinyl chloride out of the laboratory. The vinyl chloride is to be made on a 50: 50 basis with Shell Chemical Co., Shell supplying the ethylene and Diamond supplying the chlorine. Each will take half of the monomeric vinyl chloride—either to sell, or to make polyvinyl chloride.

Why? Reasons for alkali-chlorine companies' urge to get into manufacture of insecticides and herbicides are plain as a pikestaff. Nearly all of the post-DDT insecticides and herbicides such as benzene hexachloride and 2,4-D, require large quantities of chlorine. And the price structure that exists for chlorine provides such a low profit—when it is marketed as such—that producers are beating the bushes to find products which will provide a better return on the invested capital. Research-minded Raymond F. Evans, Diamond's president since 1947, sparked the moves.

Not New: The situation that has developed in the alkali-chlorine industry *CW, June 30* has built a terrific pressure for some method of providing a suitable return from the new plant facilities that are being installed by nearly every company in the industry. And the industry is moving to meet it.

How? The approach taken by each of the various companies varies in detail; but nearly all first made carbon tetrachloride and sulfur chloride, then moved into chlorinated solvents. The latest move is into the chlorinated

DIAMOND'S PRESIDENT EVANS: His own best customer.

insecticides and herbicides. But these are not all. Each company has its own "pet" secondary products.

- Diamond Alkali Co.: Increase in sodium silicate, sodium bichromate, carbon tetrachloride, chlorinated paraffin. New products: DDT, benzene hexachloride, 2,4-D and 2,4,5-T.
- Dow Chemical Co.: Expansion in vinyl and vinylidene chloride, silicones and methyl chloride (Dow-Corning), methylene chloride, methyl chloride, ethylene glycol, perchlorethylene and others.
- Frontier Chemical Co.: New product: benzene hexachloride.
- Hooker Electrochemical Co.: New product: trichlorethylene (Hooker-Detrex).
- Mathieson Chemical Corp.: New products: insecticides, ethylene oxide, glycol and dichloride.
- Niagara Alkali Co.: New product: chlorinated phthalic acid.
- Pennsylvania Salt Mfg. Co.: Expansion of benzene hexachloride and DDT facilities, stepped-up output of alkali cleaners.
- Solvay Process Division: Much of its product now transferred to other divisions of the company.
- Southern Alkali Division: New products: perchlorethylene, rubber pigments, agricultural chemicals.
- Stauffer Chemical Co.: Expansion of carbon tetrachloride, titanium tetrachloride, insecticides.
- Westvaco Chemical Division: Expansion of sodium phosphates.
- Wyandotte Chemicals Corp.: Expansion of alkali-chlorine to be accompanied by upgrading facilities—organics, detergents, alkali cleaners.

Continuation: Chlorine manufacturers in many cases backed into the manufacture of organic chemicals. Liquid chlorine is costly to store, and the almost universal early manufacture of carbon tetrachloride lends credence to the report that it was undertaken to alleviate the costly problem of storing off-peak production. Carbon tetrachloride is much less costly to store.

From this beginning progress was slow, with the notable exception of Dow. But World War II saw the birth of two cycles: (1) conversion of chlorine into ethylene glycol and oxide; and (2) manufacture of insecticides and herbicides.

More recently there has been a large-scale movement into chlorinated organic solvents besides the well-established carbon tetrachloride. Diamond's move into vinyl chloride may be a portent of the future. In any event the industry will try to widen the profit margin by manufacture of additional chemicals. Eventually the production of chlorine and caustic will become a service function, much as surfuric acid after World War I.

Old Can be New

The Board of Appeals of the U.S. Patent Office has recently held that a new specific use for an old composition can be the basis for receipt of a patent (Ex parte Clarke, 89 USPQ 646). This reverses the doctrine, propounded in 1943 by the U.S. Court of Customs and Patent Appeals, that patent claims simply covering a new use of an old composition are unpatentable.

The applicant, Clarke, had sought a claim to internal combustion engine valves made of a specific alloy which was old.

Use of a particular alloy for mak-

ing the chromium-nickel stainless steel valves, claimed by the applicant as patentable, was based upon his discovery that proper quantities of sulphur have a marked effect upon the resistance of the alloys to corrosion by lead compounds. Clarke had shown that the weight loss in grams per square decimeter per hour at a temperature of about 1,670 F is sharply decreased as the sulphur content of the steel is increased to about 0.15%. It then gradually decreases to a minimum until the sulphur content reaches 0.5%.

The Examiner had rejected the claim as unpatentable, for a reference showed that the alloys which were employed were old. There was no suggestion therein, however, that they were particularly suitable for making internal combustion engine valves.

Unobvious: The Examiner did not deny that unobvious results were produced by use of these particular alloys for making the valves in question, nor did he hold that it would be obvious to make these valves from these particular alloys. The claim was held unpatentable solely on his allegation that previous decision had laid down the doctrine that a new article, the novelty of which is simply that it is made of a different but well-known material, is not in itself patentable.

But the claims involved in the 1943 decision did not define a specific article nor mention a particular structural form. Reversing the Examiner, the Board stated: "A fertile source of error in the patent law is the misapplication of a sound legal principle established by a court of competent jurisdiction in one case to a subsequent situation in another case wherein the facts are essentially different and the principle has no application whatsoever."

Scrap Race

We're in a scramble for steel scrap, and the picture isn't good.

With the chemical industry expanding all over the country, with structural steel critically short, with steel drums and equipment keeping purchasing agents awake at night (*CW, Aug. 11*), chemical companies have a stake in maintaining steel production at its present high level of 2 million tons a week. And the chemical industry can help itself by providing every pound of scrap it can lay its hands on.

Consumption in the furnaces is running ahead of scrap collections at a time when the steel industry normally is adding to its scrap inventory. Declining inventories are normal in winter; but in May, June, and July inventories should be building for winter. They're not. In fact they are declining alarmingly—and there's the trouble.

If scrap collections don't increase enough to correct this situation, there will be less steel this winter. The furnaces won't shut down, but production will fall off. It's not a case of more pig iron—they have that; but a high rate of production depends on a lot of high-grade scrap to toss into the furnaces.

Steelmakers could go around buying old cans and steel forks; but that isn't the high-grade scrap needed, and production would still fall. So until additional capacity goes into production, the 2-million ton-a-week rate depends on an increasingly supply of heavy industrial scrap.

Industrial scrap falls into two types: "dormant," from obsolete equipment sitting around quietly waiting to be declared junk; and "production," from leftovers in processes involving the use of steel. It's the former that the chemical industry can best provide.

Industrialists are often surprised at the amount of potential scrap they have lying around their plants. In 3 months, Eastman Kodak found 88 carloads of dormant scrap just sitting in its plants.

Many reasons have combined to make the present shortage. Low production of steel equipment during the depressed '30s means less junkable equipment today. Shipments abroad during World War II took a lot of steel out of the domestic market, and declining scrap imports raise the quantity needed from home plants.

Whatever the reasons, steel is now crying for high-grade industrial scrap. It can only come from industry; and to provide more steel for drums, equipment, and building, industry must "weed" its plants for a lot more scrap.

If looming shortages of basic chemicals are to be averted, a lot of expansion is needed, and that takes steel.

Bureau Probes Ore Potentials

TRIPLE EFFECT: Research by the U. S. Bureau of Mines at Minneapolis is currently being intensified. Object: to find economical processes for getting iron and sulfur from Minnesota's reserves of iron sulfide, iron and manganese from low-grade manganese ores. Bureau estimates manganese reserves there at between 10 and 25 million tons. A cheap process could appreciably reduce our heavy reliance on imports—now supplying 90% of the metal used here.

CW INDEX

to Volume 68, Jan.-June 1951, is now in press and will be available free on request. It will not be bound in a regular issue but will be printed separately. Address requests to Chemical Week, Editorial Dept., 330 W. 42nd St., New York 18, N. Y.

DUG-IN OFFICE: The Germans learned the hard way.

Dig In or Spread Out

With the disastrous experience of the North Korean chemical industry staring it in the face (*CW, July 28, 1951*), U.S. industry has been giving a lot of attention to the old infantry watchword—"Dig in and spread out!"

But this week there is much concern in Washington over the alarming let-down in defense thinking resulting from the cease-fire talks in Korea. The latest government attempt to encourage industry to disperse is meeting tough opposition.

The measure, an amendment to the Spence Bill (Defense Production Act renewal), would direct government procurement agencies to give preference to products produced in "dispersed" areas. New England congressmen are howling mad—New England is not dispersed.

It's this fight over the "what" and "how" of industrial protection planning that is giving the National Security Resources Board and the Defense Department headaches. Despite the experience of German industry, and the well-known dispersal of Soviet production facilities beyond the Urals, industry and Washington are finding it hard to get together on just what to do.

To Dig or Not To Dig: Military thinking says, "Dig." But that costs money, and there's the rub. Industry can't do it, and the government is mighty quiet when loans or grants are mentioned.

The Army has been granted money for study of the underground problem and has come up with several hundred million square feet of usable sites in existing mines. But no actual plans have been made to send industry underground.

Even if everyone were agreed on the necessity for going underground, and on the method of getting there, it is doubtful if it could be done. Costs are so much higher for underground building that many military planners admit large-scale digging in is impractical.

Scatter: With underground plants all but ruled out as a practical measure at this time, dispersal is taking the spotlight. There is no known military defense against atomic attack except space. The handwriting on the wall is clear; strength lies in not sticking together.

Cost of atom-bomb manufacture is such that it is highly unlikely any nation will be able to afford to drop one on cities of 50,000 or less, or on industrial areas spread out beyond a five-mile radius. With these figures hot on the table, the NSRB is trying to discourage further urban concentration, and convince industry that dispersal is the first line of survival in case of all-out war.

NSRB says that the job must be taken on by industry, claiming that the government can neither dictate nor finance such a large scale change in the industrial pattern.

Before It's Too Late: Obviously someone has to decide who should do the job and get it started. The United States seems to be lagging behind its potential adversaries in industrial planning for survival. Whether government, industry, or both together, will do the job seems relatively unimportant compared to getting it done. Apparently everyone is waiting for the bombs to start falling. But then, as the Germans found out, it will be too late for really successful measures.

Pro-Labor Swing

Further weakening of employer rights under Taft-Hartley seems apparent in last week's rejection by the National Labor Relations Board of an election petition from General Paint Corp. The ruling draws an extremely fine line between when a union is demanding bargaining rights, subject to election petition, and when it is simply recruiting members.

Locals of the Chemical Workers (AFL) and Paint Makers (AFL) asked the company for recognition as bargaining agents. Neither claimed to represent a majority of employees. When the company refused, the unions threatened use of an "unfair list." The company then petitioned for an NLRB election. Union response was to picket and ask the NLRB to dismiss the petition on the grounds that only organizing, not recognition, was involved.

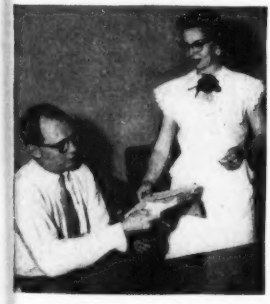
In ruling for the unions, a majority of the NLRB—members John M. Houston, Abe Murdock, and Paul L. Styles—concluded that the picketing and "unfair list" were not inconsistent with the denial that recognition was being demanded.

In dissent, NLRB Chairman Herzog maintained that the unions were claiming recognition despite their denials. "Their acts, from beginning to end, belie their words," he said. Co-dissenter James J. Reynolds, reiterated his position in earlier cases, that once a union has presented an employer with a claim for recognition, later disclaimer should not be allowed to defeat the employer's right to ask for NLRB election.

Employers Concerned: The case illustrates the basis of growing concern over future actions of the board. Since the replacement of conservative J Copeland Gray by Styles, the board has taken on a pro-labor tinge.

The probable effect of this is plain. With a pro-labor NLRB, employers will be at a disadvantage in union dealings. Where it will lead is problematical, but, judging from this latest decision, employers are going to have a fight on their hands in future months.

MEETINGS WITH INDUSTRY are only one part of busy day in life of Kenneth Klipstein, NPA Chemical Division Director.



PAPERWORK, with aid of secretary, starts whirl of tough day.

Conferences Rule Day

Anyone harboring the notion that government programs are conceived and activated by dreamers in air-conditioned ivory towers in Washington, D.C. hasn't met Kenneth Klipstein.

As Director of the Chemical Division of the National Production Authority, he is in the unenviable spot of matching the nation's chemical output with defense-spurred chemical needs. This is a post that requires diplomacy, deliberation and decision . . . and the greatest of these is decision.

But sensible and practical decisions can only be reached by the ideas of many, many

CONFERENCE with Manly Fleischmann (left), NPA chief, and assistant chief, Francis Curtis, comes next.

HUDDLE WITH EXPERTS Frederic Arden, Lucian Walker and John Wood follows. Problem: Sulfur, of course.

QUICK CHAT in hall between Klipstein and Curtis covers some points not cleaned up during regular morning session.

OFF FOR GET TOGETHER with other officials finds Klipstein giving facts to NPA public information specialist en route.

# of NPA Chemical Chief

men being sifted and sorted. Hence, Klipstein's daily calendar constitutes a long list of conferences, planned and unplanned, formal and informal . . . but all requiring alert attention.

But fortunately for the nation, the NPA and his own nervous system, long training as an executive of the American Cyanamid Company, from which he is now on leave, has equipped Klipstein with the stamina needed to resist the abrasion of the Washington grind. But its still harder to sweat out the problems of an industry than those of one company. Ask the man who does it.

PHONE CALL HOME to postpone dinner; too much work.

FACTS AND FIGURES are a big part of Klipstein's chores. Man supplying numbers is assistant, Francis Hoffheins.

LATE CALLER from industry gets Klipstein's advice on problem. Prospects of dinner grow dimmer. Whatta life!

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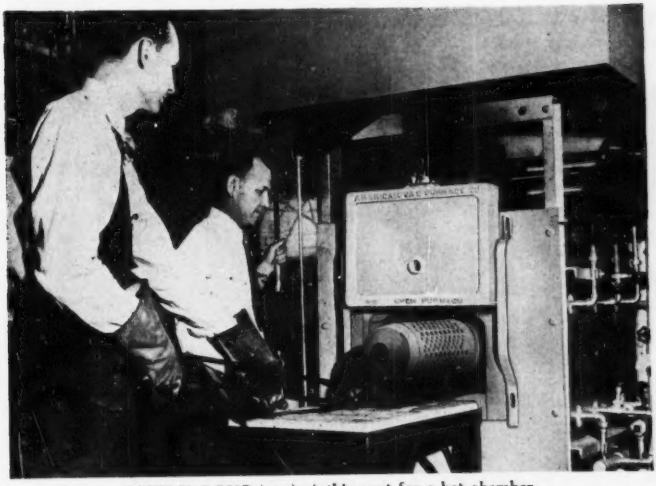

JOHN V. LONG (rear): A thin coat for a hot chamber.

Strategic Cost-Cutter

A West Coast aircraft company has come up with a new ceramic coating that can be applied to metals by a spray process. The ceramics, able to stand up under intense heat and corrosive action, are slated for service in jet engines. Chief short-term benefit will be a substantial saving in many strategic metals. Peacetime industrial uses will follow a slack-off in military demand.

Details of the new process – called Solaramic by its owner, the Solar Aircraft Co. of San Diego–are being kept secret in the interest of national security, but this much is known: The ceramic material is milled and formulated into a paint-like material; metal parts are cleaned by conventional methods, dipped or sprayed, and oven dried; final step involves firing.

The defense effort will be first to reap the rewards of Solar's achievement. Costly alloys of scarce metals (i.e. cobalt, tungsten, columbium, etc.), now needed for jet aircraft engines, may soon be replaced by more plentiful Solaramic coated materials at no sacrifice in performance.

Steel For Nickel: Jet combustion-chamber liners are a good example. These parts must withstand extreme heat, are expensive to produce, last only 200 hours in flight. In the past they were produced from a 78% nickel alloy. With the Solaramic coating, a stainless steel containing only 8% nickel is used to make a liner with the same life at a fraction of the former cost. Nickel use is cut 90%.

Although Solar is now applying its discovery chiefly to jet engine parts, other military applications are also getting the once over. Peacetime potentialities: Refractories, engine parts, and a wide range of process uses involving high temperatures and chemical corrosion.

According to research director John V. Long, the new process utilizes a number of different ceramic mixes for different uses. While the coating is extremely strong, it is much thinner than other ceramics and can be rapidly heated or cooled without cracking or flaking. In some cases the coat actually expands and contracts with the metal base.

Solaramic production goes exclusively to the armed services. A new pilot-plant will soon be in operation at San Diego, but it's doubtful that civilian industrial demand will be satisfied for some time to come.

Industry Takes Over

The National Production Authority has in the mill this week a plan for allocation of chemicals. It is designed to correct a situation wherein complaints from chemical manufacturers are literally pouring into Washington.

Approved by NPA's Chemical Division and slated for top-level decision soon, the plan is intended to correct the present allotment system which, claims industry, is playing havoc with its whole distribution set-up.

While the definite pattern is still undetailed, it will probably include the following rulings: (1) a chemical allocation program similar to that in effect during World War II; (2) continuance of the Defense Order priority system for the military, essential defense, and Atomic Energy Commission contractors; (3) for other users, a system of over-all NPA allotments of major chemicals, and distribution of other chemicals by informal agreement based primarily on past usage.

NPA's Chemical Division realizes that more than token enforcement of this program would be impossible with present staffs. For this reason, industry committees may handle stop-gap allocation details. Allocations above historical quotas, then would be requested through an industry committee, with decision subject to appeal to NPA. Possible trouble in this arrangement would come if some user thought he wasn't getting a fair break from his fellow industrialists.

Present government thinking is that this plan would only be in effect until its own detailed allotment procedures could be worked out. But smooth administration, and diminishing complaints, would be points in favor of leaving allocation procedures in industry's hands.

Basic Objections: Chemical manufacturers don't like the present procedures because they have disrupted normal distribution–something which NPA thinks shouldn't have happened. According to the government's theory, persons with Controlled Materials Program allocations for steel, copper, and aluminum–which allow them to slap DO rating on chemical orders–shouldn't have appreciably changed their usage of chemicals, except in the case of such militarily essential items as polyethylene. But they have.

Those now suddenly favored by CMP regulations have grown voracious and are taking a bigger bite of the supplies than had been anticipated. This means that a company

Current List of DPA—Certified Chemical Facilities

COMPANY	LOCATION	PRODUCT	AMOUNT ELIGIBLE	PERCENT
American Cyanamid	Bound Brook, N. J.	Anthraquinone	$ 497,000	60
E. I. du Pont de Nemours & Co.	Deepwater Point, N. J.	Tetraethyl lead	957,000	85
do.	do.	do.	94,000	15
Merck & Co.	Danville, Pa.	Penicillin	5,914,806	60
General Chemical Division, Allied Chemical & Dye Corp.	North Claymont, Del.	Sulfuric acid	3,552,000	80
Mathieson Chem. Corp.	Saltville, Va.	Chlorine	662,700	50
Union Carbide & Carbon Corp.	Marietta, Ohio	Ferro-Alloys & Calcium Carbide	78,538,800	65

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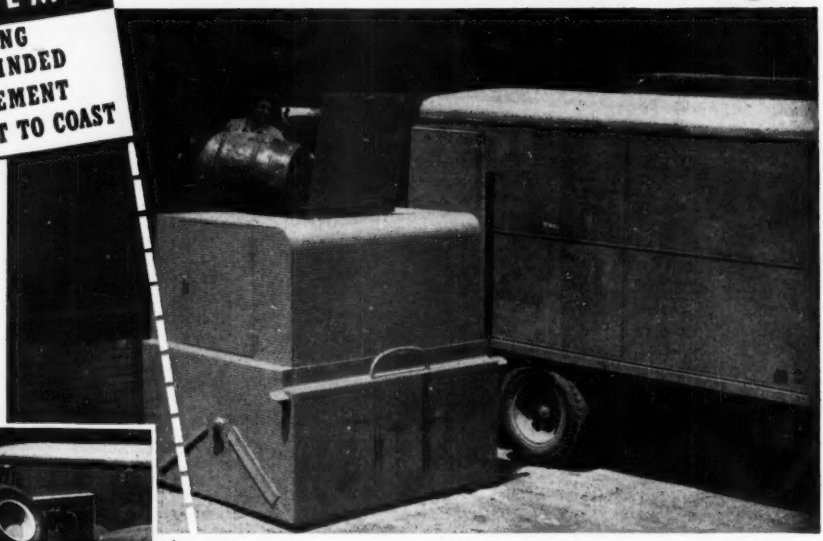

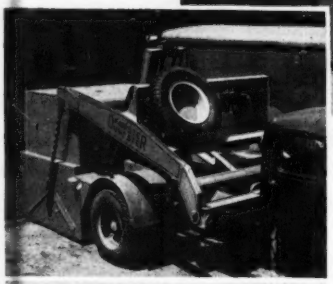

Photos show a Universal Type Container being loaded, Dempster-Dumpster ready to pick it up and place it in carrying position, and container being emptied. Entire operation is handled hydraulically by means of controls at driver's seat.

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given an allotment of copper to make jewelry can get a priority rating for chemicals, and snag a larger supply than a company making more vital plastics. And that makes chemical producers boiling mad.

The government tends to lay the trouble on the doorstep of CMP-lucky companies. NPA officials compare them to long-denied children being turned loose in a candy shop: many of the companies on CMP allotment have been forced to get along with substitute materials for some time, and now that they have a priority rating, they're running hog-wild buying chemicals.

Future Outlook: The way it looks, unless some radical switch occurs in NPA thinking, all orders but those entered by military, Defense Department, or AEC contractors will be allocated on historical-use basis, with detailed allocations handled by an industry committee.

But it's obvious that the committee would definitely be on its good behavior—any mismanagement, or industry complaints, would mean immediate reversion to strict governmental control.

EXPANSION . . .

Sharples Chemicals: New facilities for making alkylamines are now in operation. Additional output will help to meet increased demands by the plastics, agricultural, rubber, petroleum, paint and other industries.

•

Eli Lilly: Construction is underway on the new penicillin-streptomycin plant near Lafayette, Ind. The plant will consist of ten buildings, including three for actual processing. Production is scheduled to start in about two years.

•

Celanese Corp.: Increased activities by the Chemical Division have necessitated a new laboratory building at Clarkwood, Tex. Construction will start immeditaely, lab will be completed in about a year. Cost of project: $500,000.

•

B. F. Goodrich Chemical: The new plant for making polyvinyl chloride at Avon Lake, Ohio, is now in production. Production there will supplement that from the company's other plants at Louisville, Ky., and Niagara Falls.

•

Heyden Chemical: A 30% increase in research activities is the goal of new laboratories to be built at the Chemical Research Division at Garfield, N. J. One of the principal reasons

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for the move is a planned program to intensify development of new applications for pentaerythritol derivatives.

•

Glidden Co.: Inauguration of a new sales program is expected to give better service to its customers. The program: Salesmen from both the powdered metals and metal oxide units are now equipped to sell all products made by the Chemical and Pigment Division.

•

FOREIGN. . . . . .

Canada: The new cellulose plant of Columbia Cellulose (subsidiary of Celanese), which went into production in April, is already in the middle of an expansion program. Capacity goal is 300 tons a day; present capacity, 200 tons.

•

Philippines: A sulfur dioxide plant will be built to supply the proposed Maria Cristina fertilizer plant. Raw material will be indigenous pyrites.

KEY CHANGES. .

Carl O. Hoyer: From division engineer in charge of design and maintenance, Monsanto's Plastics Division, to director, Central Engineering Department, Chemstrand Corp.

Maj. Gen. Thomas F. Farrell: From deputy administrator, Defense Production Administration, to assistant general manager for manufacturing, Atomic Energy Commission.

Lawrence W. Bass: To chairman of the Committee on Equipment and Materials, Research and Development Board, Department of Defense.

James Van Lanen: From research project supervisor to assistant research director, Central Research and Development Department, Hiram Walker & Sons.

Arthur R. Schramm: To executive associate general sales manager, Abbott Labs.

Fred W. Lawson: To manager of professional relations, Abbott Labs.

Joseph S. Rowe: To assistant manager of the drug trade division, Abbott Labs.

H. W. Prentis, Jr.: To board member, Atlantic Refining Co.

R. W. Merritt: From coordinator, Manufacturing Department, to assistant vice president, National Starch Products.

S. F. Thune: To assistant vice president, National Starch Products.

Michael Fuhrmann: To sales manager, B. L. Lemke & Sons.

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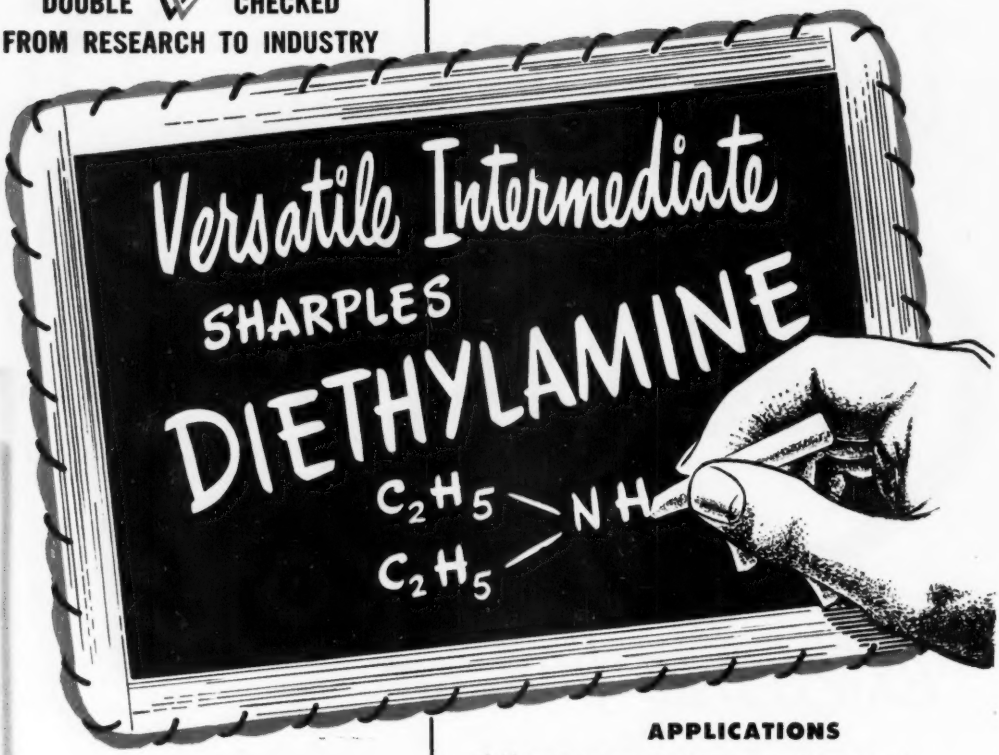

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- Antilivering agent for enamels
- Intermediate for organic synthesis
- Intermediate for pharmaceuticals
- Intermediate for rubber chemicals
- Intermediate for textile chemicals
- Solvent

OTHER PROPERTIES

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Flash Point (open cup)	Below 0°F.
Soluble in water and most organic solvents	

SPECIFICATIONS

Color	Water white
Specific Gravity @ 20/20°C.	0.70-0.71
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I.B.P.	53°C. (min.)
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REPORT: Lignite squeezer Parry (right) reports progress to his chief, Ralph Brown.

Tar and Char, Power Too

Low temperature carbonization of lignite to provide new low-cost fuel supply for Alcoa's new aluminum smelter in Texas.

By-product of carbonization will be large quantities of tar, possible raw material for much need aromatics.

A new process for the low temperature carbonization of coal will make its commercial debut in Texas by fall of next year. Preliminary reports indicate that it will represent the last word in methods to wring high grade solid fuel (char) and a liquid fuel or chemical feed stock (tar) from lignite.

First installation of the new process, which was developed by the Bureau of Mines, will be to provide fuel for power generation at the Aluminum Company of America's planned plant (85,000 tons of aluminum per year) in Milam County, Texas. Power generating facilities are to be built and operated for ALCOA by the Texas Light and Power Company who cooperated with the B of M in the development of the process.

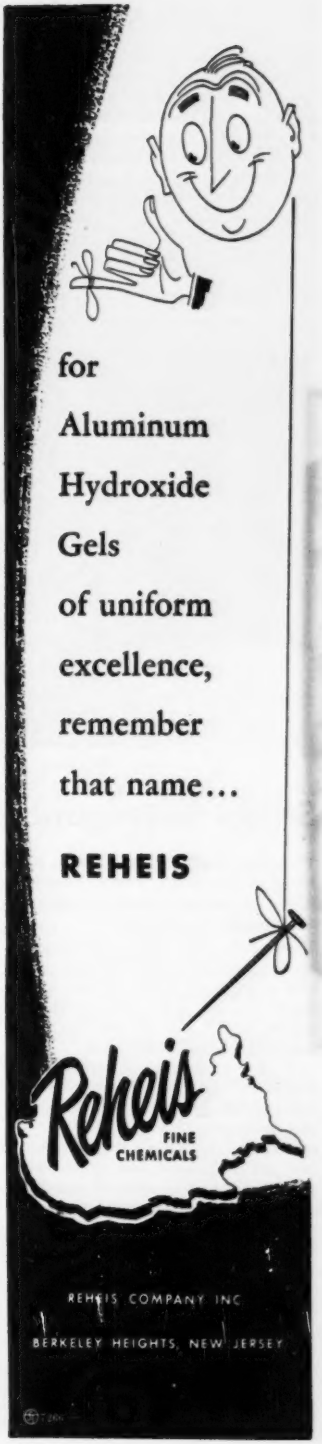
Chemical Font: In the new plant, about 7000 tons of raw lignite will be processed daily to produce an estimated 3,200 tons of char and 2,300 barrels of tar. The latter will provide excellent feed stock for conversion to hydrogenation to the much desired low molecular weight aromatic hydrocarbons: benzene, toluene and xylenes.

Just how much of the tar can be sold for this purpose, however, remains a question. The market is limited and as yet, undeveloped. Hence, it would appear that the Bureau of Mines' estimate of the tar's value at 8-10 cents a gallon may be a bit optimistic. The fuel value is the only one that can be counted on for the tar at this time. And this is much nearer to 4 to 5 cents a gallon than the figure cited by the Bureau.

Fuel Use First: As a fuel producer the process offers its greatest immediate overall value. V. F. Parry, chief of the Denver Laboratories of the Bureau claims it will yield a char that "pilot plant results indicate will enable even this fuel (lignite) to compete with natural gas selling at 5 to 8 cents per thousand cubic feet."

The expert said that this fact indicates why the Texas Power and Light Company had an interest in the research project of his organization. Parry added: "Texas Power and Light uses natural gas in its existing power plants and anticipated in 1949 the current high and increasing prices."

By Fluidization: Heart of the process are the twelve 575 ton-a-day char producers (cost: $(million) which will handle the lignite after it has been crushed and dried. Feed will be crushed to ¼-inch particles and dried in a "Boiling" bed at 350 deg. F., with the hot products of the combus-



tion or flue gas providing the heat.

Once dried, the material will be moved from the dryer pneumatically to the carbonizing reactors where its temperature will be raised to 950 deg. F. in an externally heated retort to drive off the tar and produce the char. During this treatment the feed will be fluidized by circulating gas and air. Bureau of Mines' experts estimate that the operation can be carried out with an overall termal efficiency of 91%.

End Products: The char (10,600 But per pound) will go directly to the boiler plant. And as circumstances indicate, the tar recovered will be used as fuel or subjected to further refinement. An added bonus may come from the light hydrocarbon fraction (naptha) which can be recovered by distillation and mixed into gasoline.

Similarly, as economic conditions permit, the tar acids can be extracted by standard methods of removal from coal tar, although the yields would be somewhat lower than afforded by regular coal tar distillation.

Figures and Future: Though some experts may doubt some of the specific figure cited by the Bureau, the overall economics of power generation must be correct. Too many veterans in power generation have had a hand in the development to warrant a second look at the power figures quoted.

The future of the process as a chemical raw materials source is another question. It is probable that the large quantities of tar to be produced might tempt the interest of an enterprising producer.

BEFORE AND AFTER: A little good housekeeping, a lot of black ink.

Scrap Segregation Yields Hidden Treasure

With the wolf of higher costs nibbling at processors' profits, chemical firms are planning closer scrutiny of scrap disposal methods.

This week, Jack Kiley, president of an industrial scrap disposal firm, gave CW a series of hints on how to increase profits on waste materials which, as he puts it, are "just raw materials in the wrong place."

A plus value for intelligent scrap disposal is that government price control regulations put a premium price on well-segregated scrap. Such reusable items as drums and containers also are included under government regulations. While some of the government regulations don't seem too realistic, they're here and they've got to be lived with.

Segregation Saves: On scrap materials as such, regulations specify that the most a mixture can bring is the ceiling for its meanest component, whether it makes up 1% or 99% of the mixture. Thus, segregation is even more important to maximize scrap profits.

In the junking of old metal equipment, divide not only into ferrous and non-ferrous metals, but subdivide further. For example, segregation of steel alloys containing nickel, molybdenum, manganese, chromium or tungsten not only helps to conserve these valuable alloying agents which are in short supply, but also brings an extra premium payment.

Care of containers will also save processors money. If rims are damaged during opening or if they are allowed to rust through standing outside, the need for reconditioning can knock dollars off the resale price.

Baling—as well as segregation—of such commodities as paper or corrugated cartons can increase scrap returns. A junk dealer can pay more for cartons if he can haul a batch away at one time, rather than taking several trips to get uncollapsed cartons.

Some scrap and waste material has found rather novel uses. Take fly ash, which is usually an all-over-the-place nuisance. Kiley's firm, Flett Inc., was able to arrange the sale of one company's fly ash to a paint manufacturer for use as a lampblack substitute. Possible future use: in cinder block coloring.

Kiley, whose firm has arranged scrap disposal for such companies as General Aniline & Film, General Mills, Mathieson and Monsanto, disclaims special skills.

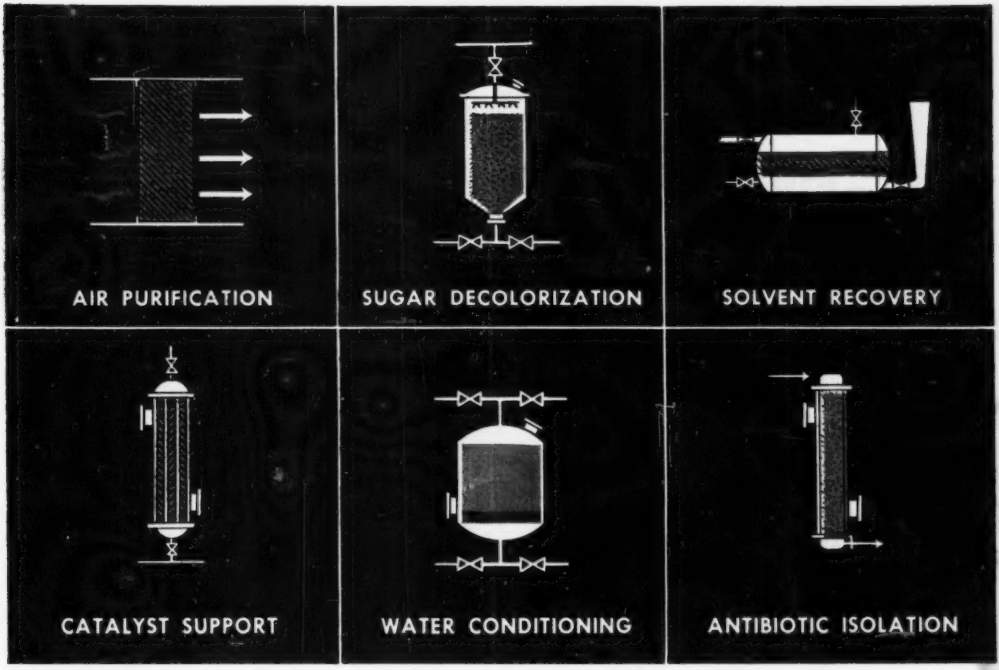
"We do nothing anyone else couldn't do," he asserts, "if they wanted to devote the time to it. It's nothing but good housekeeping."

•

Chromium Over Brass: The current shortage of nickel spurred Du Pont's Electrochemicals Department to dust off some 1938 research and develop it further to the point of commercial application.

The new process, available to industry, permits electrodeposition of chromium on a "white brass" alloy consisting of 80/20 zinc-copper. The base alloy is electrodeposited from a cyanide bath using special brightening agents. From that point on chromium is deposited in the usual manner.

Automotive and other industries are now carrying out plant tests.



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Formula 300	6.0%	21.0%	70.0%	3.0%
Formula 400	6.0%	6.0%	85.0%	3.0%
Formula 1000	6.0%	20.0%	70.0%	4.0%
Formula 1500	6.0%	20.0%	60.0%	14.0%

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Formula 400	99-103	60-64	3.0 Max.	196.9-204.8	196.9-204.8	4.0/1.0
Formula 1000	99.0 Min.	58	6.0 Max.	196.9 Min.	196.9 Min.	35.0/5.0*
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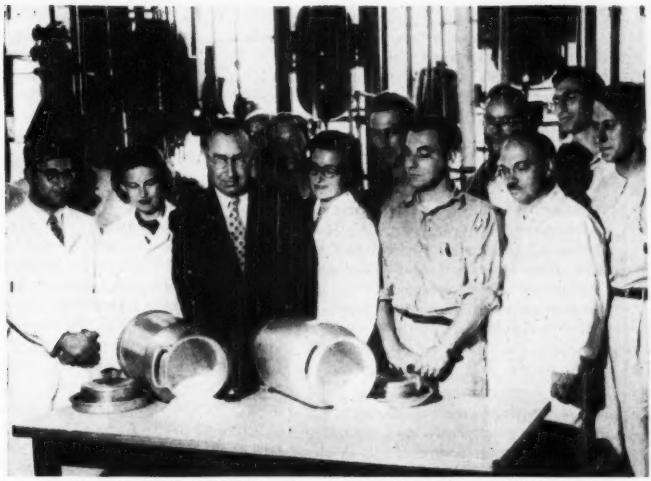

SCHERING RESEARCHERS: The next move came from another quarter.

Cortisone Conquered

Cortisone from plentiful raw materials is the news from research teams of Merck & Co. and Harvard University.

Both have new syntheses: Merck's converts abundant natural steroids; o-toluidine is the starting substance for the Harvard total synthesis.

It could mean plenty of cortisone at lower cost—but not for some time. Process development won't be easy.

Cortisone has been making news headlines this past week, but not without ample forewarning. A scant month ago, the Mexican firm Syntex S. A. reported success (*CW, July 21*) in its efforts to convert diosgenin, a steroid derived from yam roots, into cortisone. This achievement, a milestone in the annuals of synthetic organic chemistry, freed cortisone manufacture from the constraints of a limited raw material. Syntex was confident its new process would break the cortisone bottleneck and satisfy entire U. S. demand in three years.

All eyes were on Merck & Co., only commercial producer of the scarce drug and still tied to a process using ox-bile as a raw material. But the next move came from another quarter. Schering Corp., Bloomfield, N. J., hit the newspapers with a new cortisone-based ophthalmic preparation. Schering too, had a cortisone process—based on ox-bile to be sure—but one that nevertheless would cut costs and help end the shortage.

According to the daily press, Schering had substantially stepped-up the yield from the ox-bile starting material. Certain reports hinted that Schering's process gave a 50-fold better yield than the existing Merck process. It's not true. It would be far more accurate to say that the Schering process yields cortisone on a competitive basis with the Merck process. And that's quite an achievement for a company that started cold in cortisone two years ago.

This week, Merck made cortisone news in its own right. A research group headed by Max Tishler put the finishing touches on a synthesis starting from the relatively abundant steroids, cholesterol, ergosterol, diosgenin and stigmasterol. Chief problem in converting these steroids to cortisone is the introduction of an oxygen atom in the 11-position on the steroid nucleus. Unlike desoxycholic acid (from ox-bile), none of the four steroids has functional groups to ease this operation.

In May, Merck chemists did the job, synthesized 3-acetoxy-11,20-diketo-allopregnane. The latest Merck development involves the conversion of this compound to cortisone by the substitution of hydroxyl groups at positions 17 and 21 and the introduction of a double bond between 4 and 5.

Significance: The Merck synthesis, like the earlier Syntex advance, opens the door to a lot more cortisone from abundant sources. But it's going to take time. The laboratory procedure will have to be stepped up to a workable commercial process, raw material sources must be developed, and new capacity brought in. In the meantime, Merck will continue making cortisone from ox-bile.

But sometime in the not too distant future, you can look for commercial cortisone from coal tar. That's the story behind Harvard's entry in the cortisone derby. Close on the heels of Robert B. Woodward's first total synthesis of a steroid (*CW, May 5*) comes the news that a combined Harvard research effort has succeeded in converting this synthetic steroid to cortisone.

Woodward's group made the first synthetic steroid by a 30-step procedure starting from simple o-toluidine. In the next phase, the team of Woodward, Sondheimer and Taub transformed the steroid to methyl-3-a-acetoxy-$\Delta^9(11)$-etiocholenate, formerly available only from the degradation of bile acids. At this point, the team of Fieser and Heymann applied their new procedure for the introduction of an 11-keto group.

Result is 3,11-diketoetiocholanic acid, familiar to cortisone researchers as an intermediate in the original Reichstein-Kendall-Sarett bile acid synthesis. Remaining steps to cortisone are well known, presented no new problems. The entire build-up from o-toluidine involves 48 steps.

Still Far To Go: The Harvard total synthesis, a commercial diamond in the rough, will take a lot of polishing before it resembles a large-scale process. This in no way dims the brilliance of its achievement, but a commercial totally synthetic cortisone is still a thing of the future. A major part of the Woodward-Fieser synthesis breaks new ground, will take many months for process adaptation and evaluation.

There's no guarantee that a practical large-scale process will be developed. If it can be done, however, the raw material problem will be licked once and for all; o-toluidine is a far cry from ox-bile. The National Research Corp. will administer all patents arising from the work at Harvard. Licensing will be on a non-exclusive basis.

The cortisone story is far from fin-

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ished. Work continues, both in this country and abroad*, highlighting one of the most intensive research campaigns ever undertaken. Cortisone has been conquered in the laboratory, but the process development people would give a lot to know how much fight it has left.

Acetylate With Ease

Isopropenyl acetate is now commercially available from Carbide and Carbon Chemicals Div. of Union Carbide after a year of pilot-plant production. A useful acetylating agent, the compound facilitates the preparation of a number of interesting monomers and also forms copolymers with vinyl, maleic and fumaric esters.

Mild acetylations are made to order for isopropenyl acetate. Compounds like tertiary alcohols and hydroxy esters that tend to dehydrate in the presence of acetic anhydride are easily handled by isopropenyl acetate with a suitable acid catalyst.

In this way, a variety of valuable monomers may be prepared. Vinyl acetate is obtained from acetaldehyde, 1-acetoxy-1,3-butadiene from crotonoldehyde and α-acetoxystyrene from acetophenone. Many such acetylated products are new and present a fertile field for the development of potentially important polymers.

Isopropenyl acetate itself may be polymerized (by using a peroxide catalyst) and copolymerized with vinyl compounds and esters of maleic and fumaric acid. These copolymers are now being investigated and show promise not only in synthetic fibers, but also in plastic molding and sheeting applications.

Reactions: A place as an intermediate is indicated by isopropenyl acetate's reactivity. It combines with alcohols to give esters, with acids to give mixed anhydrides; amines yield amides and active hydrogen molecules are readily attacked. Moreover, halogens add to it, and it forms isopropenyl esters with carboxylic acids and proper catalysts.

The commercial newcomer, a water-white liquid selling for about 55¢ a pound, is prepared by the reaction of ketene and acetone. Both Carbide and Tennessee Eastman Corp. have had the material in limited production for some time, but equipment and materials shortages undoubtedly slowed its climb up the commercial ladder.

* One Australian researcher at the University of Melbourne is now on the trail of cortisone substitutes. His work has attracted considerable attention. The Australian government is building new labs to aid the research.

Fast and Brilliant: A new series of stable, fast-color bases called Spectrolenes by the Hilton-Davis Chemical Co. rapidly mix with naphthols to produce brilliant shades. Tests have shown them effective for textile dyeing and printing. The bases are completely diazotized and stabilized to prevent premature coupling with naphthols in solution. Acid or acidified steam releases the base from the stabilizer.

•

New Labs: Pittsburgh Coke & Chemical Co. has completed the first major unit of its new central research laboratories at Neville Island, Pa. The new unit more than doubles the company's laboratory space, was designed to handle additional research requirements of expanding production in fine and synthetic organic chemicals.

•

Eye Aid: Merck & Co. is now offering three new ophthalmic preparations of cortisone. This step comes close on the heels of a similar move by Schering Corp., Bloomfield, N. J.

•

Bath Cleaner: Barisol BRM, Dexter Chemical Corp.'s new dye assistant, is useful as a sequestering agent for pectins and other complex substances found in cotton. Phosphate radicals are held responsible for this activity. Product is intended for use in vat and sulfur dyeing of cottons as a wetting agent and dye leveller stable to hot alkaline solutions.

•

DDT Stabilizer: Nitrocycloparaffins, added to solutions of DDT, benzene hexachloride, and chlordane, prevents separation of the chlorinated hydrocarbons even at temperatures as low as –30 F. Researchers of Standard Oil Co. of Indiana did the work now covered by U.S. Patent 2,543,955.

•

ACTH Confab: The chemistry of ACTH will be the subject of an international symposium to be held September 18 at the Palmer House in Chicago. Armour and Co. will sponsor the get-together designed to shed light on the structure of proteins.

•

Toxicity Probe: Researchers at Pennsylvania State College have recently investigated the relationship between chlorine content of aromatic molecules and toxicity to insects. In some cases, toxicity increases with an increasing number of chlorine atoms; in others, the opposite is observed. Conclusion: No correlation between per cent chlorine (or number of chlorine atoms) and toxicity in the compounds tested.

WHAT'S NEW

AN ADVERTISING PAGE

by the HOUSE OF J. HAYDEN TWISS

A review of interesting products and services

PROMISING NEW MITICIDE — After two years of extensive tests, SULPHENONE (Compound R-242) Miticide, which is stable in acid and alkaline sprays, will be available for sale on the West Coast in limited amounts in 1951 for use on Apple, Pear and Almond for the control of Clover Mite, European Red Mite, Two-Spotted Mite, Pacific Mite and Willamette Mite. Generous quantities of SULPHENONE 40W, a 40% wettable powder, will be supplied without charge to entomologists and other qualified persons for field trial and experimental purposes. Experimental quantities of a 25% emulsifiable concentrate will be stocked for special problems. For additional information and supplies of SULPHENONE, direct inquiries to Stauffer Chemical Company, Technical Director Agricultural Sales, 420 Lexington Avenue, New York 17, N. Y.

WHITER THAN WHITE — Those "improved" home laundry soap products that wash clothes "whiter than white" are based upon a scientifically sound principle rather than an advertising man's dream, according to Antara® Products, Division of General Dyestuff Corp. Antara® Brighteners — optical whitening agents of high activity — do the trick by attaching to the washed fabric, absorbing only the invisible ultra-violet light rays and then transforming these rays into a visible blue fluoresence. These Antara® Brighteners, which are actually colorless, fluorescent, "dyestuffs" can be used with soaps, detergents, "built" soaps, in commercial laundries or for the brightening of starches and whitening of high quality pulps.

A NEW REFRACTOMETER — Valentine Technical Instrument Corporation has come up with a new and improved precision refractometer which gives instant 5th place decimal readings directly from the sector scale. Among its other improvements, this new, counterbalanced instrument has fully adjustable adjacent eye pieces with interchangeable optics for white or monochromatic light. In fact, it is wired for everything but sound. Take a good look at your present refractometer. If you don't want a new one, we suggest a face-lifting job on your present equipment to include some of these new features.

CREAM CHEESE — This concerns cream cheese that would not spread. A manufacturer of fine cream cheese wanted to improve his existing product. The reason: the cream cheese crumbled instead of spreading smoothly. The problem was turned over to Innis, Speiden & Co.'s Product Development Department which soon came up with the answer — a cream cheese stabilizer that worked. Isco constantly meets similar problems in almost every conceivable industry such as chemicals, cosmetics, drugs, pharmaceuticals, foodstuffs, etc. If your product or process develops a kink, perhaps Isco's long experience in knowing the potential of the products they make and sell can help you as they have many others. Just remember Innis, Speiden as an intelligent source of supply.

LOOKING FOR A LOW-COST, ABUNDANT REPLACEMENT? — INDULIN lignin is a by-product of the Kraft paper industry. Industrial Chemical Sales Division West Virginia Pulp & Paper Company tell us that they are now producing 3 uniform, reproducible grades of INDULIN lignin and that the production could be increased to 350 to 400 tons daily . . . with a probable decrease in its cost. Industrial's Development Department will be glad to furnish samples of INDULIN lignin and technical data on its potential uses. It is already being used in commercial quantities in the following: rubber, ceramics, textile dyeing, protein removal, storage batteries, fire foams, drilling muds, and asphalt emulsions.

POLYOXYMONOESTERS — The uses for Polyhydric Alcohol Fatty Acid Esters change as their molecular weights increase. Diglycol Laurate, for instance is used as emulsifier in textile processing and a defoamer in paper manufacture, while Polyethylene Glycol 400 Mono Laurate is a non-ionic detergent and wetting agent as well as an emulsifier for insecticides. The Glyco Ester Catalog contains detailed information on how these versatile products find uses in such industries as metal, plastics, insecticides, pharmaceutical, detergents and many others. A request to Glyco Products Co., Inc., 26 Court Street, Brooklyn 2, will bring you your copy.

SODIUM-CALCIUM — A Sodium-Calcium combination product, normally recycled in the manufacture of Metallic Sodium has been made commercially available by National Distillers Chemical Corporation, which produces Metallic Sodium by the electrolysis of Sodium Chloride. National Distillers offers the combination product as a low-cost source of Metallic Sodium, or for reactions where the Calcium content of the product will prove advantageous. Here is a typical analysis (by weight) of the combination product: Sodium — 65-75%, Calcium — 15-25%, Sodium Monoxide — 10% (appr), Chlorides (NaCl & $CaCl_2$) — 1%. This Sodium-Calcium product is shipped in brick form, packed dry in 55-gal. drums. Further information may be had by writing the company at Ashtabula, Ohio.

99.99% PERFECT VACUUM — Croll-Reynolds Co., Inc. claims it's easy to obtain this near-perfect vacuum with four or five-stage steam jet evactors. C-R four-stage units are maintaining industrial vacuum down to 0.2 mm. and less. C-R one, two and three-stage units are used on all types of equipment to maintain vacuum for intermediate industrial requirements. Croll-Reynolds "Chill-Vactors" solve cooling problems from a few tons to 1,000 tons or more. If you have a vacuum problem — no matter what — the C-R engineering staff, with its specialized experience, is at your service. Croll-Reynolds offers interesting catalog on steam jet uses. Send for one.

2,4,6-COLLIDINE — The "Reilly Researchers" in a recent report to industry, announced the discovery of a method for synthesizing 2,4,6-collidine. They stated their readiness to produce this interesting pyridine in pilot plant quantities should the demand develop. Demand developed almost immediately, and Reilly's Pilot Plant is making it in ton quantities. They have raised the purity to 97.5% min. and lowered the price. 2,4,6-Collidine is an aid in the chromatographic analysis of amino acids, and a useful dehydro-dehalogenating agent. A technical bulletin describing its physical constants is available from Reilly Tar & Chemical Corp., Merchants Bank Building, Indianapolis 4, Ind.

"WHAT'S NEW" *is prepared by the staff of The House of J. Hayden Twiss as a cooperative service for its clients. The product developments and expansion programs reported here reflect the progressiveness of our clients whose advertising we strive to make technically informative, editorially interesting and psychologically persuasive. If further information is desired, please address your inquiry to "What's New" Editor, The House of J. Hayden Twiss, New York Central Building, 225 Park Avenue, New York 17, N. Y.* ©

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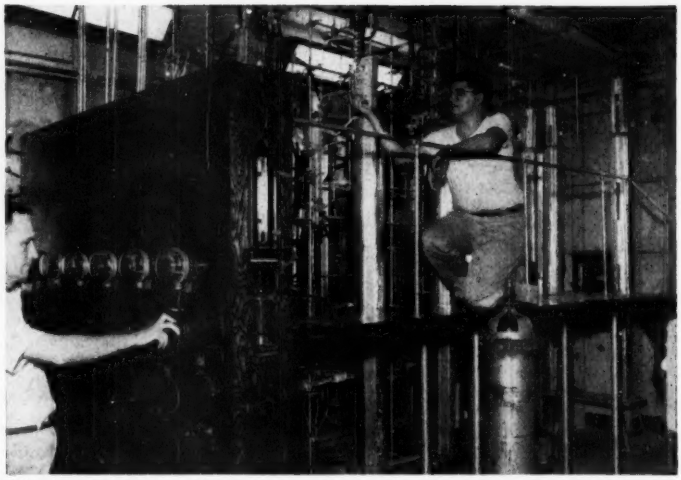

WEEDING COTTON with oil is more than pouring kerosene on the fields. Lion Oil researchers Elrod and Nelson prepare many experimental samples to get suitable fraction.

SPECIALTIES.....

Launching Cotton Weed Oil

GREENHOUSE TESTS of potential herbicides eliminate those unfit for use on cotton.

The field hand with his hoe is still a common sight in cotton fields. But his wages are climbing, so growers are seeking weed control with chemical and petroleum products.

Lion Oil Co.'s Herbicidal Oil #1 is one of the new products being sold in limited areas among pioneering planters. The company got it off to a good start by scheduling conferences between interested farmers and its technical men on the oil and its use, followed with field assistance. Distribution is being widened, but new users are still supervised by Lion men.

HERBICIDAL OIL #1 is designation given oil that passed field testing in experimental plots. Foreground rows are comparable to those treated with the new herbicide.

IMPORTANT in introducing an agricultural products, satisfactory application equipment—here tractor-mounted two-row sprayer—had to be developed as a parallel project.

FIELD of cotton kept free of weeds and grass by new oil properly applied.

FIELD INSPECTIONS are an important part of technical service to help growers use the oil.

CONTACTING GROWERS at field meetings is keystone of Lion's marketing program. Herbicide project director Talley tells about oil, shows movie on it, answers questions.

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Detergent Surge

Sales of synthetic detergents continue to gain as soap falls off. Figures of the sales census conducted by the Association of American Soap and Glycerine Producers, Inc. reveal that sales of synthetic detergents reported by 37 manufacturers for the first half of 1951 total 612 million pounds, exceeding the first half of 1950 (34 companies reporting) by 17.8%. Domestic sales of non-liquid soap for the same period, however, registered a decline of 1.5% from the previous year.

Reports from 57 soap manufacturers who have been supplying the Association with sales statistics since 1935 show the 1.5% decline. Their non-liquid sales for the first half of the year totaled 1,058 million pounds as contrasted with 1,073 million for that period in 1950. Total sales of non-liquid soap by 93 companies representing a very substantial portion of the industry's volume were 1,105 million pounds.

In the second quarter of this year, both non-liquid soap and synthetic detergents fell off considerably from the very good first quarter sales (which may have reflected considerable scare buying by household consumers). Here again, while soap showed a drop of about 42% in sales, synthetic detergents fell off only about 20%.

The recent trend toward use of household liquid synthetic detergents is shown by the figures for their sales. In the first half of the year, 20.2 million pounds were sold. While this represents but 3.3% of the sales of all synthetic detergents, it is a considerable gain over the first six months of 1950, when only 8.1 million pounds were sold, a scant 1.6% of the synthetic detergent total.

Liquid soap, too, shows a substantial gain over last year. Sales of 54 manufacturers during the first six months were 2.9 million gallons, an increase of 31.3%.

Foreign Move

Potential market in Latin America leads Diversey Corp. to set up subsidiary to sell its industrial cleaners and insecticides there.

The wholly-owned subsidiary, Diversey International Corp., that has just been established *(CW, July 14)* will handle sales in all countries of the Western Hemisphere outside of the U.S.A. It means that the company will actively solicit business in areas previously served only upon request from customers in those countries.

H. W. Kochs: Education for expansion.

The new company will operate out of the home office in Chicago, but a branch office and a plant south of the border will be considered as sales grow.

Although Diversey has no statistics on consumption of various "sanitary chemicals" in South and Central America, H. W. Kochs, Diversey chairman who will act as president of the new subsidiary, is optimistic about the area's potential demand for them. He believes that Latin America is on the threshold of a major industrial expansion which will bring with it an increasing awareness of the need for improved public health and sanitation practices. He thinks that education will be the prime factor in developing the new market, will have Diversey "quality control" engineers there to help in such education—and to build sales for its cleaning, disinfecting and insecticidal products used in food-processing and other industrial plants.

The company, founded in 1923*, began foreign operations with the formation of Diversey Corp. (Canada) Ltd. in 1937. World War II delayed further expansion until 1947 when Diversey Australasia Pty. Ltd. was formed. A plant was opened at Port Credit, Ontario last fall to serve Canadian markets.

Although it always operated as an independent company, Diversey itself has had close relations with another chemical company—Victor Chemical, which owned 75% of the outstanding shares of the company until it dis-

*By a group meeting in a restaurant on Chicago's Diversey Ave. First product was an ammoniated cleaner for washing dishes and cleaning walls.

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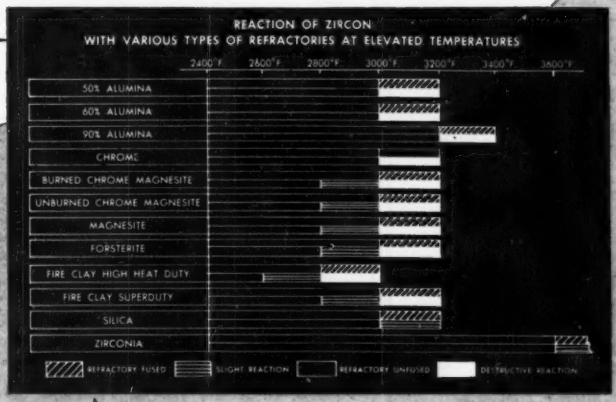

● **Charted here is the reactivity in the temperature range from 2400°-3600°F**

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posed of them last December. Diversey had purchased a good proportion of its basic chemical materials from Victor, and still is a good customer; but it is now also a substantial customer of half a dozen other basic chemical producers.

Originally manned by three men and capitalized at $10,000, the company now has 300 sales engineers, 300 in offices, laboratories and factories; serves 27,000 customers; and is capitalized over $2 million with over $8.5 million sales yearly. Two plants are located in Chicago, one in Macon, Ga., and one in Canada; in addition, plants have recently been opened in South Gate, Cal. (spring 1950) and Newark, N. J. (May 1951). If Koch's optimism about Latin America is well founded, these figures are due for a boost.

Compact Blender Plant: Three types of blenders designed to provide mixers of field-strength insecticides and formulators with a complete yet moderately priced insecticide processing plant that is ready for operation on delivery, have been developed by A. E. Poulsen & Co. (Los Angeles).

Sold as R.T.R. Uni-Blenders, they are: standard type, which mixes and blends one or more concentrates with diluents to produce finished products; "hi-capacity" type, which is the same as the standard functionally but has double its capacity; and the dual type, which formulates dust-base concentrates from technical grade toxicants and also blends these concentrates with diluents into finished products. There is also available supplemental equipment for liquefying solid toxicants and for injecting either liquid toxicants or liquid concentrates.

•

New Company: Crawford Chemical Co., Inc., Bartlesville, Okla., has been organized with capital stock of $25,000.

•

Squeeze Dispenser: Winthrop-Stearns is promoting sales of phisoHex, its hexachlorphene-containing anti-bacterial detergent for doctors, nurses, etc., with a special package combining a filled squeezable polyethylene bottle of the detergent with a wall bracket of polystyrene. In use, the bottle is turned upside down in the bracket and squeezed to dispense a stream into the palm of one hand. Plax Corp. (Hartford, Conn.) supplies the polyethylene bottle, used for the first time as a mounted dispenser.

•

Italian Bentonite: Whittaker, Clark & Daniels, Inc. (New York City) is again importing white Italian bentonite of both the high gel and low gel types. This colloidal clay, scarce for several years, is used in pharmaceuticals, cosmetics, soaps, water paints, adhesives, paper coatings, etc.

•

Bigger Building: Woodbury Chemical Co., manufacturer of weed killers and insecticides, has moved to larger quarters in St. Joseph, Mo.

•

Louisiana Adhesives: Swift & Co. hopes to occupy the new adhesive plant and laboratory it plans for the New Orleans area at Harvey, La., by late fall. The new plant will be adjacent to the Swift refinery at Harvey, will produce diversified types of adhesives, including dextrines, animal glues, resins and rubber based products. Output is expected to be several million pounds a year to serve industries within a 300-mile radius of New Orleans.

•

Ceramic Floor Cleaner: S. C. Johnson will soon launch a national promotion campaign for the latest in its line of maintenance products, Emerel, a floor cleaner and deodorizer formulated especially for terazzo, marble, ceramic tile and vitreous tile, although it can be used on all types of floors. It is a concentrate to be sold in 1-gal. bottles, 5-gal. cans and 55-gal. drums. In use, it is mixed in a ratio of 1 to 20 with hot or cold water.

•

HTH Tablets: Mathieson Chemical Corp.'s HTH (high test calcium hypochlorite) is now being sold in tablet form in conjunction with a feeder called a Hypochlorinator, which is designed to dissolve the tablets and dispense the resultant available chlorine solution at easily controllable and quickly variable rates. Each tablet weighs about one-sixth of an oz. The tablets sell for about the same price as granular HTH, come packed in 100-lb. non-returnable drums.

The combination is expected to be of particular advantage for chlorinating small potable water plants; industrial waste and sewage; water in canneries, swimming pools and bottle washing equipment in dairies; etc.

•

PICTURES IN THIS ISSUE:

Cover (top)—Wide World Photos; Cover (bottom)—Lion Oil Co.; p. 14—Bureau of Mines; p. 19—Solar Aircraft Co.; p. 29—Wide World Photos; pp 32-33—Lion Oil Co.

Vibrin case history

...that opens up new polyester potentials

In the dramatic history of plastics, it is difficult to single out the stars. Yet, certainly, the rise of polyester plastic resins has made one of the most exciting stories.

In the few years from 1946 to 1950, polyester sales have grown from 1½ million pounds to 7½ million pounds — a full five-fold increase!

Polyesters are taking over the manufacture of hundreds of products — tubing, fishing rods, boat hulls, trailer parts, lamp shades, furniture, stand-up screens, light diffusers, aircraft parts, many, many more. Again and again, polyesters have introduced *higher product quality* and *lower production cost.*

Just as an example, see what Naugatuck's new Vibrin polyester has done for the battery boxes produced by Lanfare Molded Products, Inc., Toledo, Ohio, for the Nu-Form Battery Corporation, Port Clinton, Ohio. Then send the coupon below for the facts about what Vibrin can do for *your* product.

Vibrin has made battery boxes *light, strong, heat-resistant* and *corrosion-resistant.* And it can produce them more rapidly.

What's behind all this? See the notable list of Vibrin properties given here. Vibrin is a product of the Naugatuck Chemical Division of the United States Rubber Company. Insure your plastics future on the *solid base* of Naugatuck — a reliable source of quality products with which you can build lasting leadership in the years to come.

Some outstanding Vibrin properties: Easy to handle — lightweight finished products • Cures without porosity • 100% reactivity — no weight change • Electrical grades — low water absorption • Wide hardness range • Full color range • Flame-resistant types

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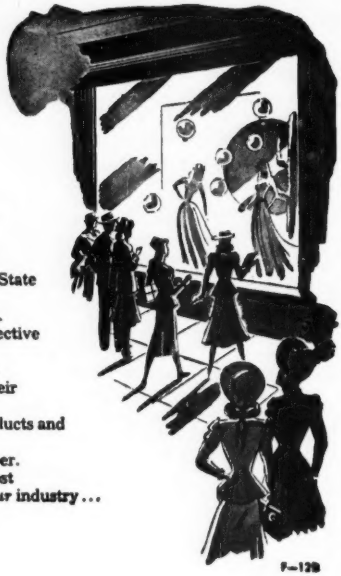

P-129

McGRAW-HILL PUBLICATIONS

BOOKS.....

Radioactivity Applied to Chemistry, edited by Arthur C. Wahl and Norman A. Bonner. John Wiley & Sons, Inc., New York, N.Y.; xv+604 pp., $7.50.

Written with the purpose of making known to readers the work done in radioactivity as applied to the various branches of chemistry, this book follows this objective through in two ways. Accordingly, the first part of the book deals with the principles involved in the application of radioactivity to chemistry, the nature of these applications as well as their possibilities and limitations. In the second part the authors uphold their purpose by offering in 18 detailed tables, arranged according to subject, a summary of the literature in this field; the numbers, order, and subject matter of the tables correspond to those of the chapters.

The Pectic Substances, by Z. I. Kertesz. Interscience Publishers, Inc., New York, N.Y.; 640 pp., $13.50.

This monograph comprises a survey of the pectin compounds—their nature, occurrence, biochemical behavior and commercial application. The author discusses the pectic substances from five major standpoints and thus the book has five divisions: the chemistry of pectins, botany, biochemistry, manufacture and lastly, some functions and applications of pectic substances and of pectic enzymes. Multiple illustrations and tables are utilized to clarify points discussed.

MEETINGS..

Tanners' Council of Amer., annual meeting, Waldorf-Astoria Hotel, New York, N.Y., August 21-22.

Amer. Pharm. Assn., Statler Hotel, Buffalo, N.Y., August 26-31.

Summer Symposium, Nuclear Energy Development, annual meeting, Oak Ridge, August 27-September 7.

Amer. Chem. Soc., Diamond Jubilee Meeting, New York, N.Y., September 3-7.

Natl. Agric. Chems. Assn., annual meeting, Essex & Sussex Hotel, Spring Lake, N.J., September 5-7.

Amer. Soybean Assn., annual meeting, Fort Des Moines Hotel, Des Moines, Iowa, September 6-8.

Natl. Instr. Conf. & Exhibit, Sam Houston Coliseum, Houston, Texas, September 10-14.

Amer. Inst. of Chem. Engineers, national meeting, Sheraton Hotel, Rochester, N.Y., September 16-19.

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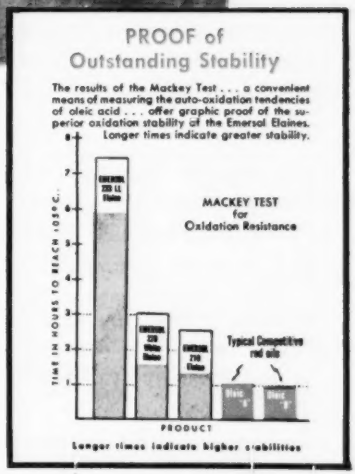
PROOF of
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The results of the Mackey Test . . . a convenient means of measuring the auto-oxidation tendencies of oleic acid . . . offer graphic proof of the superior oxidation stability of the Emersol Elaines.
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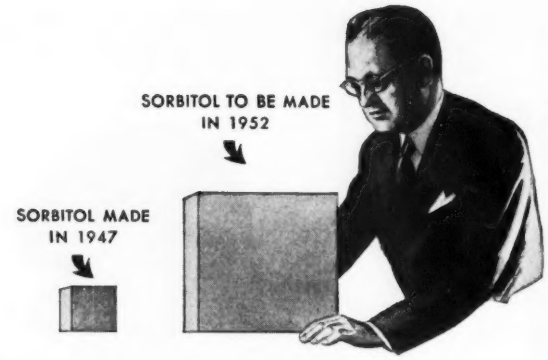
221 N. LaSalle St., Chicago 1, Ill.
420 Market St., San Francisco 11, Calif.
Export: 5035 RCA Bldg., New York 20, N. Y.
Warehouse stocks also in St. Louis, Buffalo and Baltimore

Representatives:
Schibley & Ossmann, Inc., 33 Public Square, Cleveland 13, Ohio
Ecclestone Chemical Co., 2673 Gwoin, Detroit 7, Mich.



What can sorbitol's expanded production mean to you?

Atlas is now *doubling* its sorbitol production. By the end of 1951, sorbitol production will be *ten times* what it was only four years ago . . . more than *thirty-five times* what it was in 1941!

This new expansion of our sorbitol facilities means that the country's defense and civilian industries soon will have a more ample and dependable supply of polyhydric alcohol derived from abundant corn sugar. What's more, production can be expanded further to meet new demand for polyhydric alcohols—there is no shortage of raw materials for sorbitol production!

Now is the time for producers of tobacco products, cosmetics, pharmaceuticals, resins, cellulose films, explosives, or any product to which "conditioners" are important to plan to make the most of the advantages of sorbitol.

Remember! sorbitol is the polyol least subject to wild fluctuations in price and supply. And quantities for large scale plant-trial are available on short notice.

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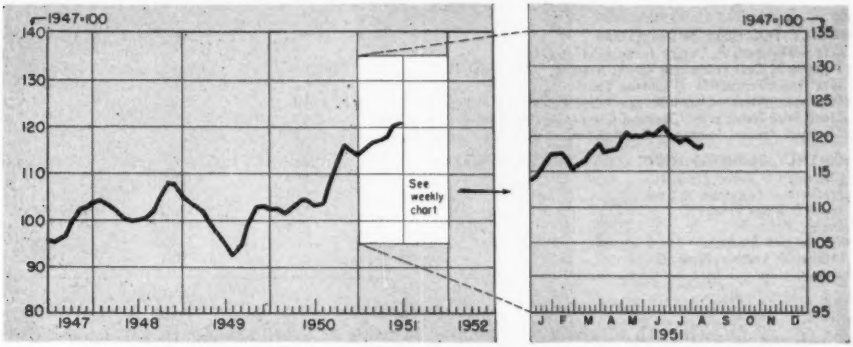
CHEMICAL MARKETS . . .



CW Index of Chemical Output—Basis: Total Man-Hours Worked in Selected Chemical Industries

The chemical industry did a double take this week when the National Production Authority hinted at lifting of chemical allocations for all but top-priority needs. Many producers agree this action might untangle some DO snarls, but wonder about the apparent reversal of NPA policy.

Good bet: NPA feels that most chemical supplies are improving, and that the Controlled Materials Plan for metals will channel chemicals where they are needed most.

But allocations of supply-short chemicals and chemical products are still pending as industry advisory committees meet with NPA. Phenol-formaldehyde resins are getting a thorough going-over this week. The outlook: not-so-good for the near future, better by 1953.

One resin producer cited the fact that defense orders are now taking some 80% of his total output, and other makers voice the same plaint. Until more production comes in next year, it looks like fewer plastic home appliances, more abrasive binders, brake linings, and plywood adhesives.

Phenol supplies may be ample by 1953, but formaldehyde will still be perhaps 15% short, NPA thinks. Phenol output two years hence is expected to climb to 530 million pounds annually, compared to the 343 million-pound capacity at the start of this year. Formaldehyde production by the end of 1953 will be some 125 million pounds higher than the yearly 300 million pounds available now.

If polyethylene is moving away from allocations, it wasn't apparent to many plastic converters. Military demands are taking around 50% of available supplies, will take still larger amounts.

But happily, some supply easing is due with new production coming in next month, and more next year, by the two major producers (see p. 43).

There's been a lot of speculation whether or not—but this week CW learned that Hancock Oil Co. (California) will definitely get under way this year on construction of a $4 million plant at Long Beach. Products: ethylene glycol and ethanolamines. First producer of glycol on the West Coast, Hancock probably will find a ready market in anti-freeze by next season.

MARKET LETTER

MARKET LETTER

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
Chemical Industries Output Index (1947=100)	119.3	119.0	108.4
Bituminous Coal Production (Daily Average, 1000 Tons)	1,668.0	1,712.0	1,761.0
Steel Ingot Production (Thousand Tons)	2,029.0	2,021.0	1,931.0
Wholesale Prices—Chemicals and Allied Products (1926 = 100)	140.0	139.8	120.8
Stock Price Index of 14 Chemical Companies (Standard & Poor's Corp.)	255.4	251.1	185.5
Chemical Process Industries Construction Awards (Eng. News-Record)	$15,554,000	$25,885,000	$24,849,000
MONTHLY BUSINESS INDICATORS—HOURLY WAGES	**Latest Month**	**Preceding Month**	**Year Ago**
Chemicals & Allied Products	$1.649	$1.634	$1.507
Products of Petroleum & Coal	2.019	1.995	1.814
Paper & Allied Products	1.527	1.522	1.396
Rubber Products	1.683	1.657	1.572
Textile Mill Products	1.322	1.328	1.208
Leather & Leather Products	1.273	1.283	1.172

Growth of chemical industry in the Far West and South will be fostered by the higher freight rates granted to the nation's railroads by the Interstate Commerce Commission this week. Allowances for rate boosts vary from 6-9%, with the highest increases applying to the Eastern and North Central States. More results to come: shift to water and motor transport, a tendency to higher costs for chemicals.

Access to raw materials and markets explains the expansion move of General Aniline & Film Corp. to Doe Run, Ky., to make more nonionic detergents. On the West Coast, Oronite Chemical Company is on the way to making more alkanes for alkyl aryl sulfonates. These signs point to continued growth in detergents, while soap sales are in a slump.

Similar demand letdowns apply to rayon and leather, fallen temporary victims to seasonal apathy and inventory caution. Aftermath of the decline, easing in acetic acid and in chromium chemicals.

None-the-less, tanners protest a slash in sulfuric acid allotments. so that when demand picks up, they won't lack for this chemical staple.

Some supply improvement may be attributed to increased imports. Shades of the impact of the Torquay agreement loomed before the organic chemicals industry as the Tariff Commission made public its annual round-up of coal tar chemical imports.

Imports of intermediates totaled 5.5 million pounds, compared to 3.6 million pounds in 1949, and 2 million pounds in 1948. Biggest gains: naphthalene and cresols from the United Kingdom, phthalic anhydride from Germany.

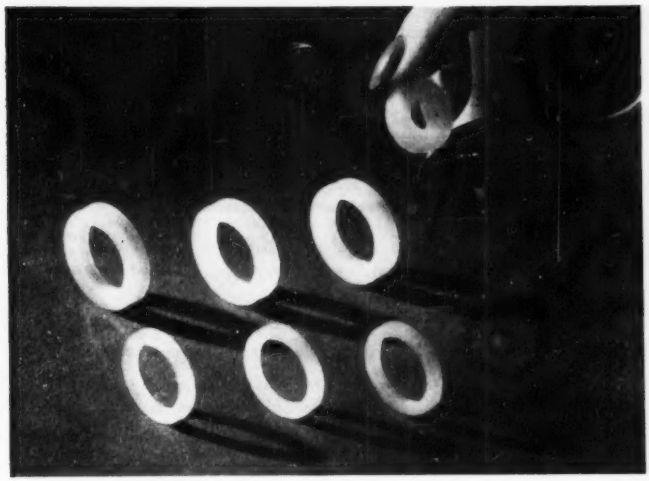
Of finished coal tar chemicals, 5.7 million pounds came in during the last year compared to 1.4 million pounds in 1949 and 1.6 million pounds in 1948. Dyes alone account for around 75% in this group. Switzerland's loss in this dye business has been Germany's gain.

Imports of German dyes climbed from less than 1% in 1949 to 19% in 1950; Switzerland's share fell off from enviable 97% in 1949 to 73% for the past year.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending August 13, 1951

	Change	New Price		Change	New Price
UP					
Aldrin, carload, 60%	$ .04	$1.10			
DOWN					
Cresylic acid, imp., gal.	$ .10	$1.45	Quicksilver, 76 lb. flask	$4.00	$200.00
Rosin, gum, WW Savannah, cwt.	.15	8.10			

All prices per pound unless quantity is stated



POLYETHYLENE PLASTIC: A life-saver for the military.

Only the Half of It

Bakelite and Du Pont expansions in polyethylene will boost output over last year by 40% in 1951, 120% by the end of 1952.

Armed services already snare 50% of available supply now under allocations, plastics converters hope the squeeze won't worsen.

When expansion program is completed by 1953, polyethylene will play a bigger role. Coming: spurt in containers and piping.

Some of the hope that springs eternal rubbed off this week on users of polyethylene. Reason: Bakelite division of Carbide and Carbon Chemicals Corp. will go on stream next month with an expansion of present facilities at Charleston, W. Va. By the end of this year, the boost, around 70% of Bakelite's current capacity, will swell the U.S. total by some 15-20 million pounds annually.

Putting Out: It is quite possible that with the new production, Bakelite will soon exceed present capacity of the pioneer U.S. producer, E. I. duPont de Nemours & Co., Inc., only other major polyethylene maker. But Du Pont is not one for napping, either. Expansions are planned for the Sabine River plant in Texas to come in both in 1952 and 1953. Still further expansion is eyed by both companies to retain their up-front position in this active market.

How Much: Consensus of the plastics industry today is that total current output of polyethylene is around the 55 million pound annual figure, with Du Pont holding a slight edge as of now. Because of the fact that there are only two producers, the U.S. Tariff Commission cannot disclose production figures.

Nevertheless, a reasonably accurate estimate can be made. The National Production Authority, which earlier this year allocated polyethylene supplies, gave out some information this spring that provides some clues on who makes how much. This agency estimated that production in 1951 will be some 40% over 1950, and that production in 1952 will be 120% over the 1950 mark.

Assuming present output at 55 million pounds, and Bakelite's share at 25 million, a 70% increase amounts to 17.5 million pounds, smack in the middle of the 15-20 million pound capacity boost reported.

Du Pont, on this basis, is probably making 30 million pounds a year and reportedly should double this by the end of next year, to give a total 60 million pound capacity by that time. Taking the NPA capacity estimate for 1952 at around 120 million pounds, indicates that Bakelite's expansion next year will be almost exactly the same as the up-coming boost.

Pentagon Again: Whether or not this producer activity means substantial relief for the civilian user, the military at least will be better off. The plans of the Pentagon are geared to the moves of the Kremlin brain trusters, which can quickly flicker or flame. But it is virtually certain that needs for the armed services are due for a climb.

According to the NPA, the military snared around 44% of the total new supply of polyethylene in July, and in August 53% is destined for the same goal. NPA estimates the end-use pattern for July came out as follows:

Polyethylene Supply Division in July, 1951

Purpose	*Per Cent*
Military	45.8
Non-packaging	27.2
Packaging	12.9
Closures	1.6
Open-end (unrestricted)	12.5
	100.0

As the allocations for the armed services go up, the open-end civilian uses will feel the squeeze, but soon. Consumers can only hope that new production will mount faster than defense demands.

Domesticated: What makes the restrictions on polyethylene hard to take is the home-front market's proved affinity for polyethylene products. Some of these have already attained commercial success; and others, converters are convinced, will show equally meteoric growth when supplies are on hand.

The past growth bears out this optimism, and some even foresee polyethylene eventually as the largest volume plastic. The raw material, ethylene, is abundant and cheap. And polyethylene has a combination of properties that is possibly unique among plastics materials: low-temperature flexibility, resistance to oxidation and solvent action, strong transparent films, good insulating qualities, and water-resistance.

These versatile attributes have brought polyethylene into prominence for uses in coating paper, fabrics, and metals. However, tubing and sheeting account for the major uses today, and are the fastest-growing.

Some of the most attention-holding developments, yet under wraps, includes the usage for piping, especially for irrigation, for portable installa-

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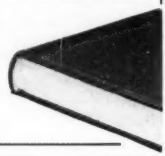

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tions, and for places where corrosion might be rough on most metals.

Another huge potential market is the successful development of polyethylene containers in over-quart sizes (*CW, August 11*). Already some plastics converters hint at making carboy sizes. This progress may eventually pose a real economic challenge to shipments in glass. Polyethylene will also vie with vinyl plastics and with cellophane for film markets.

GOVERNMENT NEEDS

Bid Closing	Invitation No.	Quantity	Item
District Engineer, 80 Lafayette Street, New York, N.Y.:			
August 20	(ENG30-075-52-41B)	972 drums	Calcium hypochlorite, 3-¾-lb. can proof drum, JAN-C-506, dated Sept. 30, 47, F.O.B. dest. and F.O.B. origin
CO Armed Services, Medical Procurement Agency, 84 Sands St., Brooklyn, New York:			
August 22	60B	576 btl	D-Mannose, 10 GM
August 22	60B	768 btl	Sodium desoxycholate, 10 GM
August 22	60B	3,264 btl	Methiodal sodium, 20 GM
Commanding General, New York Quartermaster Procurement Agency, 111 East 16th St., N.Y., N.Y.:			
August 30	52-46	283,995 lbs	Calcium, hypochlorite, 3¾-lb. can
CO Armed Services, Medical Procurement Agency, 84 Sands St., Brooklyn, New York:			
August 21	29B	42,600 pkg	Iodoalphionic acid tablets, 0.5 GM (7½ GR)
August 21	29B	6,000 btl	Procaine hydrochloride & epinephrine tablets, 100 S
August 21	29B	11,136 btl	Silver protein-mild-tablets, 0.3 GM (4½ GM)
August 21	41B	2,304 btl	Podophyllum resin, 1 oz
August 21	41B	1,224 btl	Potassium acetate, 1 lb
August 21	41B	2,304 btl	Quinidine sulfate, 1 oz
General Services Administration, 1114 Commerce St., Dallas, Texas:			
August 21	FW-16586	11,460 lb	Soap, laundry, P-S-596-A
August 21	FW-16586	12,720 lb	Soap, compound, PS-628
P and C Office—Memphis General Depot—U.S. Army, Memphis, Tennessee:			
August 24	(AM-40-110-52-1B)	12,500 gal.	Wood preservative, pentachloro-phenol
Navy Purchasing Office, 111 East 16th St., N.Y.C.:			
August 21	9,359	220,500 lb	Insecticide, Powder, Dusting
September 4	9,402	5,040 lb	Hydrogen, Peroxide
Commanding Officer, Dallas Chemical Procurement District, Dallas, Texas:			
August 20	(41-040-52-7B)	27,100 lbs	Chloracetophenone
Commanding Officer, Rock Island Arsenal, Rock Island, Ill., Procurement Office:			
August 30	(11-070-52-55B)	8,500 gal	Enamel, semi-gloss, rust, inhibiting, olive drab
CO Armed Services, Medical Procurement Agency, 84 Sands St., Brooklyn, N.Y.:			
August 23	44B	1,440 btl	Potassium, carbonate, anhydrous, ¼ lb
August 23	44B	3,360 btl	Potassium, chloride, ¼ lb
August 23	44B	5,376	Potassium, hydroxide, ¼ lb
August 23	44B	576 btl	Potassium, iodate, ¼ lb
August 23	44B	768 btl	Potassium, oxalate, ¼ lb
August 23	44B	1,152 btl	Potassium, thiocyanate, ¼ lb (reagent grade)
August 23	44B	480 btl	Saponin, ¼ lb
August 23	44B	576 btl	Sodium cyanide, ¼ lb
August 24	59B	34,704 btl	Sodium chloride tablets, 2.25
August 24	59B	48,816 btl	Sulfadiazine tablets, 0.5 GM (7-½ GM)
August 24	59B	10,176 btl	Tetrachlorethylene capsules, 1 cc
August 20	66B	3,456 btl	Alginate compound solution, K 4 oz
August 20	97Q	2,379,000 btl	Penicillin, crystalline, 200,000 units
August 20	97Q	377,000 btl	Penicillin G, crystalline, 1,000,000 units
August 20	97Q	4,006,800 btl	Procaine, Penicillin G, for Aqueous Injec., 300,000 units
Headquarters, Mobile Air Material Area, Brookley Air Force Base, Ala.:			
August 24	63B	1,344 btl	Lithium Oxalate, ¼ lb, NF Reagent grade
August 24	63B	1,248 btl	Maltose, ¼ lb
August 24	63B	32,448 btl	Sodium Citrate, ¼ lb
August 24	63B	1,824 btl	Sodium Iodide, ¼ lb
August 24	63B	6,816 btl	Sodium Thiosulfate
August 24	63B	7,680 btl	Sulfosalicylic acid
August 24	65B	201,888 pkg	Petrolatum, ½ oz
August 24	65B	28,608 box	Sodium Ascorbate, Injection, 9.1 GM
August 24	65B	3,024 btl	Methiodal Sodium Injection, 40 PC—50 CC
August 24	65B	23,040 box	Tetracaine Ophthalmic ointment, 0.5 PC ⅛ oz
August 24	65B	8,496 box	Tetracine hydrochloride, 0.01 GM (⅙ GR), 1 OS
August 24	65B	8,496 box	Thiamine Hydrochloride, Injection, 0.05 GM
August 22	70B	1,008 btl	Mercuric cyanide tablets
August 22	70B	9,216 btl	Quinidine sulfate tablets
August 22	70B	14,040 btl	Riboflavin tablets
August 22	70B	24,192 btl	Saccharin Sodium tablets
General Services Administration, Regional Information Officer, Room 528, U.S. Court House, Chicago, Ill.:			
August 23	CH-34064	825 gal	Soap, liquid, 55-gal. drum
August 23	CH-34064	1,900 lbs	Soap, laundry

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YOU CAN USE . . . . .

the SEARCHLIGHT SECTION (Classified Advertising) of CHEMICAL WEEK whenever you have personnel problems, wish to sell or purchase used chemical equipment or surplus chemicals. These ads are effective and economical.

READER SERVICE . . . . .

HOW TO USE COUPON

Circle page numbers of items about which you want more details. Then write your name and address on the coupon at the bottom of the page and mail it to us. Your request will be forwarded to companies concerned, the answer coming direct to you.

MAKES IT HANDY

Products and literature in this issue are listed on these pages. There are three indexes. (1) Editorial items on new products, new equipment, new literature; (2) products advertised. (3) The index of advertisers is on the following page.

THE NUMBERS

Advertisements:—There is a page number on the coupon for each advertisement. Before the number, may appear, L, R, T, B (left, right, top, bottom), locating the ad on the page; small letters following (a,b,c) indicate additional products in the advertisement.

Editorial Items:—Numerals are page numbers; the ABC's distinguish among items where more than one is on a page. There is a number on the coupon for each item referring to new products, equipment, and literature.

EDITORIAL ITEMS

For more data, circle number on coupon

NEW PRODUCTS

Barisol BRM 30B
Spectrolines 30A

TECHNICAL LITERATURE

CHEMICALS

Acetate Dyestuffs 48B
Emulsifiable Waxes 48A
Organic Chemicals 48C
Waxes 48D

EQUIPMENT

Electric Flow Meter System 48G
Insulation 48E
Laboratory Glassware Washer 48F

PRODUCTS ADVERTISED

For more data, circle number on coupon

Carbons, activated granular 27
Chemical processes, sodium reduction method 3
Chemicals
- Ahcoleins 33d
- Albumin tannate, medicinal T21e
- Aluminum acetate, niaproof 30a
- Aluminum hydroxide gels 25
- Animal oils T34a
- Borax and boric acid B21
- Catalysts, oxidation 49
- 2, 4, 6—Collidine 31i

Copper acetate 30h
Cream cheese stabilizers 31d
Detergents, kreelon 45
Detergents, organic, Nytron 1
Dichloran T21f
Diethylamine 24
Digitoxin, U.S.P. T21b
Di-tert-butyl-para-cresol, bulletin C-9-115 4
Electro-chemicals T22
Esters 33a
Esters
- Fatty acid 2
- Fatty acid, polyhydric alcohol 31f

Fatty acids T34c
Indulin lignin 31e
Ink, manufacturers B22
Menadione, U.S.P. T21a
Monobromated camphor T21c
Niacet 30h
Odor neutralizers B34b
Oleic acids 39
Organic 5
Perfumes B34a
Phenylacetic acid 6
Plasticizers 33b
Plasticizers, HB-40 ..... 10-11i
Plasticizers, nontoxic 10-11a
Plasticizers, ortho-nitrobiphenyl, booklet OD-102 ..... 10-11b
Plasticizers, polyvinyl chloride, bulletin O-70 ..... 10-11j
Polyester plastic resins, vibrin 37
Potassium acetate 30c
Propyl gallate T21d
Resinous plasticizer-extender for polyvinyl acetates 1
Santicizer 8 ..... 10-11c
Santomerse No. 1 booklet 10-11g
Sodium acetate 30d
Sodium-calcium combination products 31g
Sodium diacetate 30e
Solvents and chemicals, Oxygenated 23
Solvents, 601 12
Sorbitol 40
Stearic acids
- Formula 200 ..... 28a
- Formula 300 ..... 28b
- Formula 400 ..... 28c

Sterox CD, bulletin P-129 ..... 10-11d
Sterox SE & SK, bulletin P-133 ..... 10-11e
Sterox 5 & 6 bulletin, P-136 ..... 10-11f
Sucrose octa acetate 30g
Sulphenone 31a
Toluenesulfonic acid 10-11h
Vegetable oils T34b
Wetting agents 33c
Whitening agent
- Brighter A 9
- Brighteners 31b

Zinc acetate 30f
Containers, acid barrels, stainless steel 18
Evactors, steam jet 31h
Instruments, refractometers 31c
Mineral fillers, mica 48
Plant sites available in Oklahoma B32
Refractories, zircon and zirconia 35
Trucks, dump 20
Waxes, tailor-made T32

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT
Positions Vacant 46
SPECIAL SERVICES 46
EQUIPMENT
(Used or Surplus New)
For Sale 46
WANTED
Equipment 46
Miscellaneous 46
ADVERTISERS INDEX:
Chemical Service Corporation 46
Consolidated Products Co. 46
First Machinery Corp. 46
Perry Equipment Corp. 46
Purkiss Personnel 46
Truland Chemical & Engineering Co., Inc. 46

READER SERVICE COUPON

Mail to Chemical Week, 330 W. 42nd St., N. Y. 18, N. Y.

NAME _____

POSITION _____

COMPANY _____

ADDRESS _____

CITY & STATE _____

Editorial Items

30A 30B 48A 48B 48C 48D 48E 48F 48G

Advertisements

I	9	10-11g	T21a	T22	28b	30f	31d	T32	T34a	37
1	10-11a	10-11h	T21b	B22	28c	30g	31e	B32	T34b	39
2	10-11b	10-11i	T21c	23	30a	30h	31f	33a	T34c	40
3	10-11c	10-11j	T21d	24	30b	31a	31g	33b	B34a	45
4	10-11d	12	T21e	25	30c	31b	31h	33c	B34b	48
5	10-11e	18	T21f	27	30d	31c	31i	33d	35	49
6	10-11f	20	B21	28a	30e					

Expires November 18, 1951

ADVERTISER'S INDEX

ALLIED ASPHALT & MINERAL CORP. T32
Agency—Doyle, Kitchen & McCormick, Inc.

AMERICAN-BRITISH CHEMICAL SUPPLIES INC. 6
Agency—Richard Lewis, Advertising

AMERICAN POLYMER CORP. 1
Agency—Bennett, Walther & Menadier, Inc.

ANTARA PRODUCTS, DIVISION OF GENERAL DYESTUFF CORP. 9
Agency—J. Hayden Twiss

ARNOLD, HOFFMAN & CO., INC. 33
Agency—George T. Metcalf Co.

ATLAS POWDER CO. 40
Agency—The Aitkin-Kynett Co.

BOHME A. G., H. TH. 36
Agency—William Wilkens Werbung

CARBIDE & CARBON CHEMICALS CO., A DIVISION OF UNION CARBIDE & CARBON CORP. 30
Agency—J. M. Mathes, Inc.

CELANESE CORP. OF AMERICA 12
Agency—Ellington & Company, Inc.

DAVISON CHEMICAL CORP., THE . . . 3rd Cover
Agency—St. Georges & Keyes, Inc.

DEMPSTER BROTHERS, INC. 48
Agency—Charles S. Kane Co.

DREW & CO., INC., E. F. 28
Agency—The Aitkin-Kynett Co.

EASTMAN KODAK CO. 5
Agency—Charles L. Rumrill & Co., Inc.

EMERY INDUSTRIES, INC. 39
Agency—Ruthrauff & Ryan, Inc.

ENGLISH MICA CO., THE 48
Agency—Terrill Belknap Marsh Associates

ENJAY CO., INC. 23
Agency—McCann-Erickson, Inc.

FINE ORGANICS, INC. T21
Agency—Sid N. Cottin, Advertising

FRITZSCHE BROTHERS, INC. B34

GENERAL CHEMICAL DIVISION, ALLIED CHEMICAL & DYE CORP. . . . . Back Cover
Agency—Atherton & Currier, Inc.

GRAND RIVER DAM AUTHORITY B32
Agency—Watts, Payne—Advertising, Inc.

HALL CO., THE C. P. 2
Agency—Cruttenden & Eger Advertising

KAY-FRIES CHEMICALS INC. 6
Agency—Richard Lewis, Advertising

KOPPERS CO., INC. 4
Agency—Batten, Barton, Durstine & Osborn, Inc.

MCGRAW-HILL BOOK CO., INC. 44

MCKESSON & ROBBINS, INC. B22
Agency—Bisberne Advertising Co.

MT. VERNON STEEL CORP. 46

MONSANTO CHEMICAL CO. 10-11
Agency—Gardner Advertising Co.

NATIONAL DISTILLERS CHEMICAL CORP. 3
Agency—J. Hayden Twiss, Advertising

NAUGATUCK CHEMICAL DIVISION, UNITED STATES RUBBER CO. 37
Agency—Fletcher D. Richards, Inc.

OLDBURY ELECTRO-CHEMICAL CO. T22
Agency—Briggs & Varley, Inc.

PACIFIC COAST BORAX CO. B21

PITTSBURGH COKE & CHEMICAL CO. 27
Agency—Walker & Downing, Advertising

PRESSED STEEL TANK CO. 18
Agency—The Buchen Co.

REHEIS CO., INC. 45
Agency—O. S. Tyson & Co., Inc.

SHARPLES CHEMICALS, INC. 24
Agency—Sommers-Davis, Inc.

SOLVAY SALES DIVISION, ALLIED CHEMICAL & DYE CORP. . . . . 2nd Cover
Agency—Atherton & Currier, Inc.

TITANIUM ALLOY MANUFACTURING DIVISION, NATIONAL LEAD CO. 35
Agency—Comstock & Company

TWISS, THE HOUSE OF J. HAYDEN 31
Agency—J. Hayden Twiss, Advertising

UNION CARBIDE & CARBON CORP., CARBIDE & CARBON CHEMICALS CO. 30
Agency—J. M. Mathes, Inc.

UNITED STATES POTASH CO., INC. T38
Agency—McCann-Erickson, Inc.

WELCH, HOLME & CLARK CO., INC. T34
Agency—Byrde, Richard & Pound

WYANDOTTE CHEMICALS CORP. 45
Agency—N. W. Ayer & Son, Inc.

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New York 18 . . . Knox Armstrong, Robert S. Muller, Charles L. Todaro, 330 West 42 St.
Philadelphia 3 . . William B. Hannum, Jr., Architects Bldg., 17th & Sansom Sts.
San Francisco 4 . . . Ralph E. Dorland, John W. Otterson, 68 Post St.
Boston 16 . . . . . 1427 Statler Bldg.
Detroit 26 . . . . . 856 Penobscot Bldg.
Pittsburgh 22 . . . . . 738 Oliver Bldg.
St. Louis 8 . . . . . 3615 Olive St., Continental Bldg.

BOOKLETS . . . . . .

Chemicals

Emulsifiable Waxes

6-p. bulletin furnishing technical information on emulsions and microcrystalline waxes derived from petroleum, which may be used in the preparation of wax systems; included are sections outlining emulsion polish composition, suggested formulas, procedures for emulsification and possible additives for use in emulsions. Petrolite Corp., Ltd.

Acetate Dyestuffs

Bulletin reviewing firm's research studies and developments in the line of acetate dyes and especially noting its efforts with a new group of acetate colors—the first of which is to be the "Fast Blue GLF Cencentrated." Tennesse Eastman Co.

Organic Chemicals

Supplement to organic chemical catalog listing 77 new chemicals, giving molecular weights, structural formulas, and melting or boiling ranges for many of them. Distillation Products Industries.

Waxes

16-p. booklet entitled, "Dependable Waxes for Industry," detailing characteristics, suggested formulas, preparation procedures and general recommendations concerning the various types of waxes used in the cosmetic, leather, protective coatings, textile fields, etc. International Wax Refining Corp.

MICA
WATERGROUND and MICRO
Mica—a flaky mineral filler for use in Plastics, Paints, Special Cements, Rubber and Asphalt Compounds where its particular properties such as thermal and electrical insulation, transparency, toughness, flexibility and chemical inertness are of value.
THE ENGLISH MICA CO.
STERLING BUILDING, STAMFORD, CONN.

Equipment

Insulation

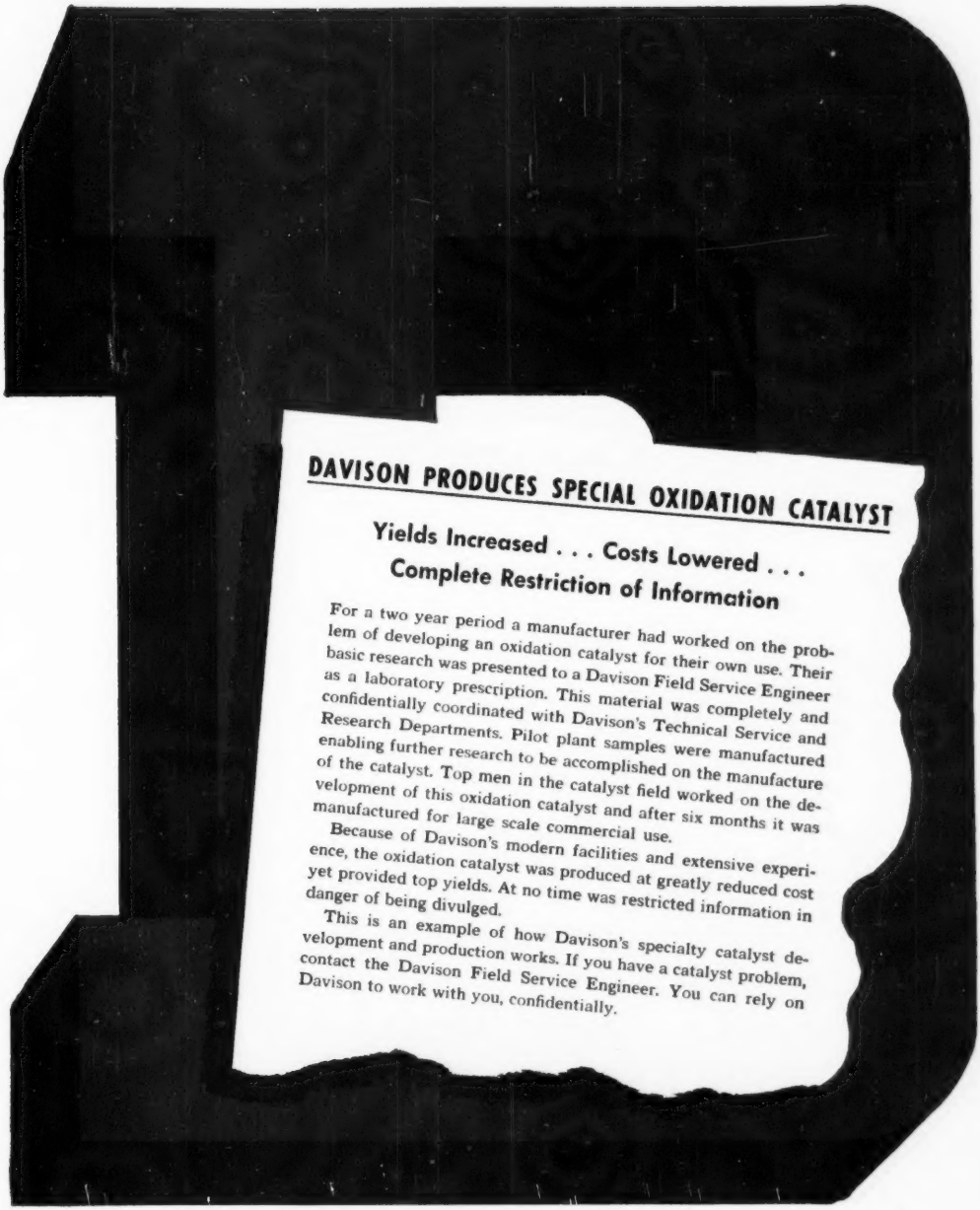
24-p. booklet featuring "Foamglas," a rigid cellular glass insulating material used for piping and process equipment; discussed here are its advantages, properties, typical data for cold, intermediate and hot applications, installation methods, accessory materials required, etc. Given in tabular form are specifications for various sizes, shapes and thicknesses. Pittsburgh Corning Corp.

Laboratory Glassware Washer

8-p. folder describing the firm's laboratory glassware washers with reference to operating principles involved, available glassware baskets and results obtained; a table lists models of the washers and accessories with respect to their capacities, functions, catalog numbers and prices. Fisher Scientific Co.

Electric Flow Meter System

Bulletin entitled, "Metering Flows in Crude Oil or Refinery Products Pipelines," outlines the operating principles and application of electric flow meter system and describes how differential pressure-type flow recorders aid in locating the source of drop in line pressure. Minneapolis-Honeywell Regulator Co.



DAVISON PRODUCES SPECIAL OXIDATION CATALYST

Yields Increased . . . Costs Lowered . . . Complete Restriction of Information

For a two year period a manufacturer had worked on the problem of developing an oxidation catalyst for their own use. Their basic research was presented to a Davison Field Service Engineer as a laboratory prescription. This material was completely and confidentially coordinated with Davison's Technical Service and Research Departments. Pilot plant samples were manufactured enabling further research to be accomplished on the manufacture of the catalyst. Top men in the catalyst field worked on the development of this oxidation catalyst and after six months it was manufactured for large scale commercial use.

Because of Davison's modern facilities and extensive experience, the oxidation catalyst was produced at greatly reduced cost yet provided top yields. At no time was restricted information in danger of being divulged.

This is an example of how Davison's specialty catalyst development and production works. If you have a catalyst problem, contact the Davison Field Service Engineer. You can rely on Davison to work with you, confidentially.

Progress Through Chemistry

THE DAVISON CHEMICAL CORPORATION

Baltimore 3, Maryland

PRODUCERS OF: CATALYSTS, INORGANIC ACIDS, SUPERPHOSPHATES, PHOSPHATE ROCK, SILICA GELS, SILICOFLUORIDES AND FERTILIZERS

You Can't Ship Acid in Paper Bags!

RETURN EMPTY ACID DRUMS, CARBOYS AND CASES—NOW!

AS THE DEMANDS FOR ACIDS INCREASE, the supply of shipping containers grows smaller by the day.

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YOU'LL SAVE TWO WAYS: your money won't be tied up in deposit charges; you won't *lose* deposits because of containers lost or damaged during long storage.

Most of all, you'll be helping General Chemical to maintain the prompt, efficient service Industry must have to meet today's demands.

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